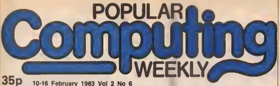
40 Lock



35p 10-16 February 1983 Vol 2 No 6

This Week

News Desk

Display stands at the Toy and Hobby trade exhibition

Toy trade moves into computers

THE 1983 British Toy and Hobby trade exhibition has now come and gone — leaving behind three new microcomputer systems

Considering the recession that has settled over the UK toy industry in recent years, the trade show was a flamboyant affair Almost 500 exhibitors took part, filling the whole of the Earl s Court Exhibition Hall on two levels

Apart from the traditional toy areas, this year's fair showed the first signs of the fundamental changes taking place in the industry as the computer and video games boom begins to take hold

Well known games machine manufacturers were there — Atari and Mattel — and both

Continued on page 5 col 1

Mattel enters micro market

MATTEL the American company behind the Intellivision video games system has announced that it is to move into the home computer market

The company is to launch a new computer system, the Aquarius, and is also to sell a range of add ons which will give the Intellivision computing power

The Aquarius is a Z80A-based machine with full size integral keyboard and 4K RAM expandable to 52K in 4K or 16K modules It has 16 colours three sound channels, and 256 graphics characters Running Microsoft Basic, the display is both upper and lower case in a 40 × 24 character format — 320 × 192 pixels

The machine will cost in the range £120 to £139, and be available in September

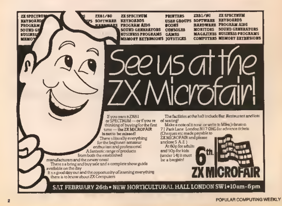
A range of add-ons is also planned for the Aquarius At the time of launch a dedicated thermal printer, cassette player and mini expansion unit will be available The

Continued on page 6 col 2

Classified

Continued on page 28

★★ BRITAIN'S HOME COMPUTER WEEKLY ★★



ZX SPECTRUM
KEYBOARDS
PROGRAM
SOUND GE
BUSINES
MEMO
ZX81/80
SOFTWARE
ZX SPECTRUM
KEYBOARDS
PROGRAM AIDS
SOUND GENERATORS
BUSINESS PROGRAMS
MEMORY EXTENSIONS
PRINTERS
USER GROUPS
BOOKS
CONSOLES
GAMES
JOYSTICKS
ZX81/80
SOFTWARE
HARDWARE
MONITORS
MAGAZINES
COMPUTERS
ZX SPECTRUM
KEYBOARDS
PROGRAM AIDS
SOUND GENERATORS
BUSINESS PROGRAMS
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POPULAR Computing WEEKLY

10-16 February 1983 Vol 2 No 6

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All submissions should be typed and a double space should be left between each line Please leave wide margins

Programs should, whenever possible, be computer printed

We cannot guarantee to return every submitted article or program so please keep a copy If you want to have your program returned you must include a stamped, addressed envelope

Accuracy
Popular Computing Weekly cannot accept any responsibility for any errors in programs we publish although we will always try our best to make sure programs work

This Week

Editorial

In a letter to *The Times* (February 3), Clive Sinclair argued for the establishment of a free port in Dundee

The basis of Sinclair's argument is that he has to pay 17 percent duty on semiconductors imported from outside the EEC This compares with a duty of just 5 percent charged on completed computers that are imported from non-EEC countries The net result is to place Sinclair at a distinct disadvantage *vis-à-vis* his foreign competitors

In the absence of any sign from the government that it is willing to remove the duty on semiconductors it makes sense to establish a free port This would allow Sinclair to import semiconductors, provided they were all subsequently exported, without paying the 17 percent duty British built Sinclair micros would then be able to compete with their foreign competitors on at least equal terms

Sinclair estimates that the establishment of a free port in Dundee would generate hundreds of extra jobs, just to meet the needs of his company

Unfortunately, the Customs and Excise Board is against the idea of free ports The Board cannot see that free ports would serve any useful purpose

Who do they think they are kidding?

Next Thursday

Dare you try to find your way through a maze of sleeping dragons? Find out next week in Ian Mercer's exciting new game for the Dragon 32.

Other highlights in next week's issue include a review of the IBM Personal Computer by Boris Allan, a ticket machine program for the ZX81 by Nick Godwin and an investment decision-making program for the BBC micro by Dan Mitchell

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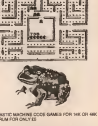
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VISA

Toy trade moves

Continued from page 1 col 3

had new machines to show Atari displayed the 5200 games machine — the successor to the Atari VCS Mattel moved into the computer market with two ranges — computer add-ons for the Intellivision System and a new computer — the Aquarius

Two other computers were seen for the first time in Britain — the Grandstand Computer from the Japanese company Tomy, and the Creativision System from Video Technology

Computer manufacturers were also represented — Commodore and Dragon Commodore showed the Vic20 and the 64 the latter with a hi-fi sound add-on

Into the leisure zone

CREATIVISION is a new modular home computer system that builds up from a basic games machine into a sophisticated personal computer

The starter unit is a 6502A-based machine, running 12K Rom Microsoft Basic with 16 colours, four sound channels (three music, one noise) and 16K Ram The screen display format is 28 × 24 characters and 256 × 192 pixels

A wide range of extension modules can be added, simply by clipping them together

Among the options are 16K memory expansion units (£39) — expandable up to 64K, cassette drive (£39 95), RS232 and Centronic interfaces (£39 each), modem and disc drive

At the time of launch an extensive range of software will be available Extended Microsoft Basic will be available in Rom Games in Rom will be priced at £19 95 each Cassette software will be launched in several areas — games educational, home and business applications

V Tech, a division of Leicester-Zone, was set up last year to develop electronic consumer products The company is headed by Kenneth Lasky, formerly Managing Director of the Laskys Hi Fi chain, and Richard Abbott formerly Merchandise Director of Dixons Retail Division

The CreatiVision computer system will be launched in June and will cost £99 95

Mattel takes on the computer market

Continued from page 1 col 4

Aquarius has one expansion port — for either a Rom cartridge or expansion Ram — into which the mini expander fits giving two expansion ports — cost around £50

Other peripherals will follow in 1984 — floppy disc drive, modem and a Master Expansion Module giving Extended Microsoft Basic and two hand controllers

Software for the Aquarius is aimed at home management, education and entertainment Initially, Logo will be available on Rom, home finance, file handling packages, and the best of the games titles presently on the Intellivision, will appear

At the same time, in September, Mattel will launch its Entertainment Computer System — a range of add-ons for the Intellivision system giving the games machine a computing capability

The central unit of the new system is the Intellivision Computer Adaptor This module plugs into the Rom port on the games machine giving it 2K of additional Ram, Microsoft Basic in 12K Rom and a full-size full-travel keyboard It will also provide additional sound channels, bringing the total to six An RS232 interface on the unit allows a printer or modem to be connected

The Computer Adaptor will sell for substantially less than £100

Several other add-on units can be connected to the Adaptor A Music Synthesizer 49-key full-size music keyboard add-on will cost around £80, two extra hand controllers can be connected allowing four player games, and the Program Expander unit gives an additional 16K Ram and 8K Rom with Microsoft Extended Basic — cost around £50

Mattell's European Marketing Manager, Peter Fitters, explains "The Intellivision system, originally launched in 1980, was always a modular system designed to expand far above the games market With the new computer add ons people can go step by step — when they want to begin computing they can build up a home computer "

Cartridge software — which plugs into the Rom port on the Computer Adaptor — will include a Basic teaching package and games based on the Flintstones and Scooby-Doo characters

New machine from Japan

TOMY, the Japanese toy manufacturer, is to market its 16 bit microcomputer in the UK

To be called the Grandstand Computer, it has 16K Rom, 16K Ram and a full-size keyboard The machine is based around the TMS 99/98 chip and has a 256 × 192 pixel resolution which is dot-addressable in 16 colours

It is unusual in that it has three modes of operation — a Basic programming mode, a Rom cartridge playing mode, and a graphics drawing mode

The Basic mode has only 19 Basic commands but this can be up-graded to provide a more extensive programming capability The up-grade also allows a printer and floppy disc drive to be connected

The Rom cartridge mode converts the machine into a sophisticated games machine Games cartridges will cost £9 95

The Graphics mode offers a quick way of defining characters and producing simple animation In the lower, smaller part of the display an 8 × 8 character display can be programmed, one colour per square This can then be converted into a single user-defined character on the main display located according to the position of a cursor In this way the whole of the main screen can be defined In addition, four 16 × 16 pixel sprites can be defined — two programmable from the keyboard, two moveable by games paddles

The Grandstand Computer is being distributed by Adam Computer Systems The basic machine will be available in the summer priced arond £160

Commodore soundbox

MICROTRADING has designed what it calls a Hi-Res Soundbox for the Commodore 64 machine

The unit gives the computer high quality sound reproduction and incorporates two loudspeaker drive units It will accurately reproduce notes between 50Hz and 10kHz at an output of 10 Watts RMS

The soundbox is available from Microtrading, 641 Bromford Lane, Ward End, Birmingham, priced at £49 45 including VAT

The programmer is helped though

We wish to make a number of comments about your review of our LMX Eprom Programmer, *Popular Computing Weekly*, 16/23 December

Firstly in the opening paragraph, the reviewer points out that the LMX was designed for use with a 1K ZX81 Later he states that the LMX software produces a peculiar display when the 16K Ram-pack is attached The size of the 1K ZX81 display file varies according to the number of characters currently required. By careful calculation it is possible to display an image in the centre of the screen without padding out blank lines with spaces This technique is used in the LMX software because memory is at a premium with the minimum system The reviewer must have been aware of this and yet in spite of his opening remarks, felt bound to make this unhelpful comment

Secondly, the LMX software was specifically written so that code could be entered in hexadecimal Hexadecimal, we believe, is the natural base for machine code programmers to use It is our belief that serious machine code programmers would not program in decimal The reviewer's comments that code would have to be converted from decimal to hexadecimal before it could be entered shows that he has little experience of machine code programming

Thirdly, unless an assembler is available, it is inevitable that code has to be entered a byte at a time Even if other software is developed so that the LMX can be used, as a programmer, with the 16K Rampack, loading bytes into an array, as the reviewer suggested, and then transferring them into Eprom still means that each byte has to be individually entered at some stage

J W Terrell
Lander Microsystems
32 Clockhouse Lane
Collier Row
Romford
Essex RM5 3QJ

Stephen Adams replies: The use of Print At routines would make it work on 16K and 1K ZX81s with no great increase in code.

Hexadecimal is useful for the programmer as it limits the number of digits printed and so can be easily formatted Basic and Assemblers are increasingly being used to make machine code writing simpler time using Hex As there were plenty of spare bytes it was a pity that this was not available as an option

Code does have to be entered one byte at a time. But only proven programs go into Eproms and these can be loaded from tape These can be quite long and a method for dumping code from program into Eprom would have been time saving.

Misleading advertising

I am writing to get your readers' reactions to Sinclair's latest advertisement for the Spectrum Microdrive The advertisement has now been amended to include a section stating that in order to connect the Microdrive, you will also need a controller unit, at a further cost of about £30

To announce this at such a late stage, when all previous advertisements implied that the Microdrive could be simply connected for around £50 is I think, deliberately misleading to those people who bought the Spectrum on the promise of the Microdrive OK so the RS232 interface and network unit will be incorporated into the controller, but that is no consolation if you did not want these in the first place

Personally, I am very annoyed, but I thought even Sinclair, whose advertisements have been misleading in the past, would not play such a trick on the people who are keeping him in business

A D Robinson
107 Doncaster Road
Wath-on-Dearne
Nr Rotherhsm
S Yorks S63 7DN

High speed not recommended

I am writing with regard to the letter published in Issue No 35 from Dickon Smith, where he asks about speeding up the Dragon by *Poking* location 65495

In my article, published in Issue No 32, I explained the use of three of the SAM registers used in setting graphics modes Location *FFD7H* (65495) is used to 'set' the register *R0* to one There are two registers *R0* and *R1* which are used to set the timing of the cpu *R0* 'set' and the cpu runs at 1.8 mhz — twice its normal speed

To reset the speed the register must be cleared This is achieved by, *Poke &HFFD6* 0

Finally by changing this register the Dragon's 6809E cpu is forced to run at double its normal speed This is a feature of the "off-the-shelf" SAM chip, but the Dragon is *not* designed to run at this speed Therefore, I do not recommend its use to speed up games etc

Brian Cadge
311 Church Road
Yardley
Birmingham B25 8XR

Slowing down problems

I was interested in reading Dickon Smith's letter (*Popular Computing Weekly* December 16, 1982) on the problem of returning to normal speed on the Dragon 32 It is true that *Poke* 65495,X (where X can be any integer between 0 and 255) increases the speed of the Dragon, by 73 percent, to be exact, and that *Poke* 65494,X returns it to normal speed

In comparing the Tandy Colour computer with the Dragon I came up with the following information which I hope will be useful to other Dragon owners

The Tandy stores its Basic commands, as does the Dragon, as tokens However, Print is 159 on the Dragon and 182 on the Tandy so loading Tandy tapes is impossible, unless you get your friendly Tandy dealer to dump the program in Ascii format *Csave*"",*A* command and load with the *Cload*"",*A* command

The keyboard reading is also different So programs which use *Peek* to scan the keyboard will not work or will return with the wrong key number

Those who write graphics games but do not have joysticks can use the arrow keys to move an object The continual need to press the keys is irritating So I came up with the following short subroutine

```
1000 FOR K=0 TO 4 L=PEEK
(314+K) IF L<>223 THEN NEXT
  K NO KEY PRESSED GOTO
1010 ON K+1 GOTO 1012,1014
  1016,1018,1020
1012 UP ARROW PRESSED
1014 DOWN ARROW PRESSED
1016 LEFT ARROW PRESSED
1018 RIGHT ARROW PRESSED
1020 SPACE-BAR PRESSED
```

Stephen Head
2 Diptford Close
Roselands Park
Paignton
South Devon

Has the Dragon breathed fire?

I bought my Dragon at the end of November and sent off my guarantee This was supposed to make me a member of the Dragon Data Club Has anyone else had a reply?

Mrs P Hampson
10 Cherry Lane
Lawton Heath
Alsager
Staffs

We can't print what isn't sent

In November I bought an Atari 400 for my birthday Since then I have not been able to find any games for it in *Popular Computing Weekly*

Will you please print some games If you do you will be one of the first magazines to do so.

Amir Anvarzadeh
4 Wymondham Court
St John's Wood Park
London NW8

As yet we are simply not being sent enough good Atari programs to publish them on a regular basis in the magazine. If there are as many Atari owners out there as the manufacturers claim, why don't any of you send in any programs?

Micros in the building trade

We are looking for a computer program for use in bending and calculating heating and cooling loads for building structures for use by us as a means of simplifying calculations

Can anyone help?

Stuart Gladwell
Manners Mackay
10 Strangeways Terrace
Truro
Cornwall

The Cavern

A new game for 16K Spectrum by David Leitch

The supply ship 'Caligulos' hovered gently in the night sky. Camak gazed solemnly down at the bleak surface of the planet below as the low-power lighting switched itself on, turning his face a pallid green. Three hours ago the ship's main generator had exploded, rendering the hyper-drive useless. Without the drive, the chances of the ship's crew seeing their mother planet again were extremely remote.

But there was an answer

Deep in the planet's bowels lay the sacred temple of the Druidians, a people shrouded in a deeply woven cloth of mysticism; it was even believed that they had found the secret of Eternal Life. The Temple contained the objects of their worship, the 'Crystals of Yoth', otherwise known as Dridimonds in Camak's galaxy, the main power source of the now disabled drive. Camak's task was to dig down into the planet, enter the Temple, steal the Dridimonds and escape.

Easy?

The Caverns were patrolled by Guardians who were telepathically linked to each other so that if one was killed another could appear instantly from anywhere. There were booby traps. Camak's ship could only stay in orbit for a limited time. Camak also knew that if he resurfaced without the Dridimonds he would not be allowed on board.

Still easy?

A faint humming filled Camak's ears — the ship had landed.

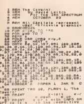
It was time.

Pardon me for interrupting this gripping tale while I describe the program. You must guide your little white man down into the Cavern and collect the Jewels therein. You can move through the green and black chequered walls and along the black passages, but not through the yellow walls.

You should by now have noticed that a little yellow Guardian is following you. He can only traverse the passages and anything, except a chalice, will block his path. You can also throw pitch forks at the Guardians (see Program for Instructions). To collect a Jewel just cross over it. I will leave you to discover what happens in the two inner Caverns.

Your score is displayed continuously and the time ticks away at the top of the screen; you must return to your ship with some Jewels before it runs out; failure will forfeit all your lives. Exterminating a Guardian on Level 2 and above may result in him dropping a chalice. This will gain an extra life for you.

Remember: A Guardian is replaced Immediately. From Anywhere.



```
1 REM The Cavern!
2 REM   By David Leitch
3 REM    For The 16K SPECTRUM
4 REM    OCTOBER 82
5 REM All Capitals represent
  User Definable Graphics
8 RANDOMIZE
10 FOR x=144 TO 156
20 FOR y=0 TO 7
30 READ z
40 POKE USR CHR$ x+y,z
50 NEXT y: NEXT x
55 DATA 60,90,127,201 180,200,
80,24 0,24,16,120,80,24,18 18,16
0,90,60,24,20,30,60,129
57 DATA 24,36 24,165,90,24,24,
36,170,85,170,85 170,85,170,85,0
0,24,24,24 24,120,126
59 DATA 0,0 0 16,56,124,88,16,
0,16,56,84,254,84 56 16 0,83 189
,219 219,189,66,0
61 DATA 0 255,189,129,189,88,6
0,36,0 252,110 103,105 110 252,0
0,0,0 255,36,36,255
63 DATA 0 126,64,32 255 32 64,
128,0 1,2,4 255,4,2 1,0 0,60,60,
60,16,16,60,0
64 BORDER 0: PAPER 1: INK 5: C
LS
65 PRINT TAB 10, FLASH 1,"The
Cavern"
66 PRINT    z-left     x-r
ight     n down     m up
67 PRINT    z or x with CAPS SH
IFT to fire   in the respective
direction
68 PRINT   INK 2    G=
50    INK 7,"    N=100"
INK 5,     O=70"
  =EXTRA LIFE
70 PRINT   Remember if you hav
e no jewels  you will not be all
owed back on board " watch out
for booby traps!"
78 PRINT   If you complete a mi
ssion you   will go on to the ne
xt level but will have less time
   Press any key to play" PAUSE
 0
79 LET hs=23498
82 LET sc=0
83 LET life=1
84 LET le=0
99 REM print board
100 BORDER 1  PAPER 0  INK 0  C
LS
101 LET z=0
102 LET j=0
103 LET pi=0
104 LET in=0
106 LET ti=1000
107 LET ti=ti-le  IF ti=0 THEN
LET ti=1000
108 IF ti=0 THEN LET ti=1000
110 PRINT AT 2,0, [redacted]
 NEXT i
121 INK 4  FOR i=4 TO 14  PRINT
AT i 0, eeeeeeeeeeeeeeeeeeeeeeee
ee  NEXT i
122 FOR i=15 TO 20  PRINT AT i,
20, eeeeeeeeeee  NEXT i
123 FOR i=17 TO 20  PRINT AT i,
1, eeeeeeeeee   NEXT i
126 PRINT AT 16,0, eeeee ,AT 16
,0, eeeee
127 PRINT AT 3,2, e ,AT 10 11,"
e ,AT 10,19,"e"
128 FOR i=4 TO 7  PRINT AT i,1
eeeee   NEXT i
129 INK 6  PRINT AT 4,6,"  ",AT
6 8,   AT 7,6    AT 20 12
130 FOR i=3 TO 15  PRINT AT i 1
      NEXT i  INK 0
135 PRINT PAPER 5,AT 21,15,le/1
00+1
140 FOR i=18 TO 19  PRINT AT i,
30, [redacted]  NEXT i
150 FOR i=3 TO 17  PRINT AT i+(
i(10),  5,    AT i+(i  0 AND i(14)
17,    ,AT  +(i 0 AND i(15),25,
  ,AT i+(i  10) 0     NEXT i
155 PRINT AT F 2
160 PRINT AT 12,9 [redacted] ,AT
0 10 [redacted]
162 PLOT INK 0 225,100  DRAW IN
K 0,30,20,-PI/4
165 PRINT INK 6,AT 9,1,"LLLL ,
INK 4,AT 9,8, "
167 PRINT INK 7 AT 16,1,"****
170 PRINT INK 5 AT 16,15,"PPPPP
PP
175 REM Jewels
180 PRINT BRIGHT 1, INK 7 AT 20
,10, MM ,AT 20,16  MM
185 PRINT BRIGHT 1, INK 2,AT 17
,8, 0 ,AT 13 17, O  AT 18,26, 0
210 LET l=2  LET c=2  GO SUB 70
00
220 PRINT INK 7,AT 0,14, "o",li
fe
222 GO SUB 8000
225 GO SUB 3000  GO SUB 8000: R
EM Move?
226 LET ti=ti-5  PRINT INK 2,AT
0,20,ti  IF ti(100 THEN PRINT A
T 0,23,
227 IF ti=0 THEN GO TO 8800
228 PRINT PAPER 6,AT 3 12, SCOR
E ,sc
230 IF l=8 AND c=2 THEN LET l=7
232 IF INKEY$="Z" OR INKEY$="X"
THEN GO SUB 1000  REM Fire?
235 IF l=9 AND c=0 THEN GO SUB
2000
240 GO TO 225
999 REM Throw pitch-fork
1000 LET s=(INKEY$="X")-(INKEY$
="Z")
1003 PRINT INK 7,AT l,c "&
1004 LET s$="M
1008 IF s=1 THEN LET s$="N
1010 LET x= 0120  BEEP x,4  BEEP
x,8   BEEP x 8  BEEP x 16  BEEP
x 12  BEEP x 14  BEEP x,16  BEEP
x,4   BEEP x 8  BEEP x,0   REM
sound effect
1012 FOR x=s+1 TO s+10 STEP s+1
1014 LET a=ATTR (l,c+x)
1015 IF a=70 THEN GO TO 1080
1016 IF a()0 THEN RETURN
1017 IF a=0 THEN PRINT BRIGHT 1
, INK 0 AT l,c+x s$  PRINT AT l,
c+x,
1018 NEXT x  PRINT AT l,c+x,"
RETURN
1020 BEEP .02 50  BEEP .04,-5  P
RINT AT l c+x,
1021 IF AND  AND le>=100 THEN
PRINT AT l c+x  INK 6, FLASH 1,
O
1050 GO SUB 5500  LET sc=sc+70
RETURN
2000 REM Oh! Dear you ve picked
up a big jewel
2003 LET in=1
2008 LET r=c  GO TO 2010
2010 LET r=INT (RND*7)+18
2020 FOR i=17 TO 09
2025 BEEP .1,-40
2030 LET ti=ti-5
2040 PRINT AT i-1,r,"  ",AT i,r,
INK 3,"F"
2041 IF i=l AND r=c THEN PRINT A
T l,c, INK 2, C   GO TO 6000
2044 GO SUB 3000
2048 IF c=11 OR c=18 THEN LET in
=0  RETURN
2050 NEXT i  GO TO 2010
2500 LET a=1
2510 PRINT INK 4, OVER 1,AT l,c,
 e
2512 LET r=INT (RND*4)+1
2513 FOR i=14 TO 10 STEP -1
2515 PRINT AT i,r   INK 7,"*",AT
i+1,r,"   NEXT i
2516 IF i=l AND c=r THEN GO TO 6
000
2517 PRINT AT i+1 r, INK 0,"
2518 LET ti=ti-5
2520 GO SUB 3000
2522 IF c)5 THEN LET c=5
2525 IF l=6 AND c=2 THEN LET z=0
  RETURN
2530 GO TO 2510
3001 PRINT INK 7 AT l c, 6"
3002 BEEP .0035,1
3003 IF z THEN PRINT INK 4, PAPE
R 0,AT l c, L
3004 IF NOT z THEN PRINT AT l,c,

3005 IF l=0 AND c=6 THEN PRINT A
T 6,6, INK 2, A    BEEP .1 -30
3008 LET a=ATTR (l-1,c)  LET b=A
TTR (l+1,c)  LET d=ATTR (l,c-1)
 LET e=ATTR (l,c+1)
3016 LET l=l-(INKEY$="m" AND l>2
 AND (a=0 OR a=7 OR a=6))+(INKEY
$="n" AND (b=0 OR b=7 OR b=6))
3020 LET c=c-(INKEY$="z" AND (d=
0 OR d)7 OR d=4))+(INKEY$="x" AN
D (e=0 OR e=7 OR e=6))
3025 LET f=ATTR (l,c)
3032 IF f(6 THEN GO TO 3050
3035 REM Checks
3039 IF f=134 THEN BEEP .1,2  LE
T life=life-1  PRINT INK 7,AT 0,
15,life
3041 IF f=66 THEN BEEP .1,40  LE
T sc=sc+50  LET j=1
3044 IF f=71 THEN BEEP .1,50  LE
T sc=sc+100  LET j=1
3049 IF f=71 AND in=0 THEN GO SU
B 2000
3050 RETURN
4999 REM Hard Luck
5000 BEEP .2,00  FOR i=-30 TO 1
STEP 2  BEEP .1,i  BEEP .1,i+10
 NEXT i
5005 LET in=0
5010 LET life=life-1
5020 IF life=4 THEN GO TO 5070
5025 IF pi=1 THEN GO SUB 5500
5030 GO TO 100
6000 INK 2  PRINT AT l,c,"C"
6002 LET z=0
6010 FOR x=2 TO 18
6020 PRINT AT x-1+(x)9),c,
6030 PRINT AT x,c, C
6040 BEEP .1,x+-5
6050 NEXT x
6060 PRINT AT 15 c, 5"  BEEP 1,-
20
6061 INK 0
6070 LET life=life+1  IF life<>4
 THEN GO TO 100
6072 IF sc>hs THEN LET hs=sc
6073 PRINT FLASH 1, INK 3,AT 10,
8, HIGH-SCORE= ,hs
6080 GO TO 7030
7000 FOR x=1 TO 30 STEP 4  PRINT
 BRIGHT 1, INK 4,AT 0, 1, IJK
7001 PRINT INK 2 AT 1,2,"I",AT 2
4,   BEEP .1,-20  NEXT x
7002 PRINT INK 2,AT l,c 0   PAU
SE 50  PRINT AT 1,2
7010 IF NOT j THEN GO TO 220
7020 PRINT INK 2,AT 1,2,"I   PAU
SE 20  PRINT AT 1,2   ",AT 2,2,

7030 FOR x=5 TO 30 STEP 3
7040 PRINT AT 0,x-4,        PRIN
T , BRIGHT 1, INK 4,AT 0,x, IJK"
 BEEP .1,x
7050 NEXT x
7058 IF life=4 OR l=0 THEN INPU
T "Press ENTER to play again";
LINE a$  GO TO 60
7065 LET sc=sc+2
7067 LET sc=sc+li
7068 LET le=le+100
7070 GO TO 100
8000 REM Move Guardian
8001 PRINT AT pl,pc
8005 LET i=ATTR (pl,pc+1)  LET k
=ATTR (pl,pc-1)  LET g=ATTR (pl+
1,pc)  LET h=ATTR (pl-1,pc)
8010
8016 LET pc=pc+(pc(c AND (i=0 OR
 i=134))-(pc)c AND (k=0 OR k=134
))
8017 LET pl=pl+(pl(l AND (g=0 OR
 g=134))-(pl)l AND (h=0 OR h=134
))
8020 IF pl=l AND pl=c THEN GO TO
 8700
8030 PRINT BRIGHT 1, INK 0,AT pl
,pc, D
8500 RETURN
8505 LET pl=INT (RND*12)+4  LET
pc=INT (RND*21)+0  IF ATTR (pl,p
c)()0 THEN GO TO 8500
8510 PRINT BRIGHT 1, INK 0,AT pl
,pc, D
8516 RETURN
8700 LET pi=1  BEEP .8,-10  PRI
NT INK 2,AT l,c  C   GO TO 5000
8800 FOR x=1 TO 80  PRINT FLASH
1  INK 0 AT 0,20,"TIME UP!"  BEE
P .3,7  NEXT x
9010 GO TO 6070
9999 INK 7  BORDER 0  PAPER 0: L
IST
```

Oric comes alive

***David Kelly** talks to Paul Johnson, hardware designer of the Oric 1*

Now that the Oric 1 microcomputer has been adopted by the W H Smith chain it seems likely that we shall be seeing quite a lot more of the machine

At just under £100 for the 8-colour 16K version the micro looks to have a lot going for it — providing early manufacturing and delivery problems can be sorted out

The machine is a joint venture between Tangerine Computer Systems and a new company, Oric Products International backed by British Car Auctions

Home for Oric is Coworth Park an imposing stately home set in 500 acres of parkland, just outside Ascot. Paul Johnson — technical director of Oric — explained how the project began The Oric was first conceived by John Tullis — back in the spring of last year He had been employed as a financial consultant at Tangerine While he was with us he came up with the idea for a home micro

As far as the specifications were concerned, we realised we would have to develop a machine at the very low-cost end of the market There were far too many computers at the business end and at that time, the only manufacturer of home micros was Sinclair 'Then, just as we started to look at the idea in more detail, the Spectrum came out '

From that point on, Tangerine knew what they were competing with The new computer was to have Basic, colour sound and a full-size keyboard

'We gave it a Centronics interface as standard so that people don't have to wait until we come out with a printer — they can connect up any other printer instead We also put in an RGB monitor output. Both the Centronics and RGB outputs cost next to nothing to include — so why don't other companies do it?

We stuck with the 6502 processor — which we used on the MicroTan — because it's probably the world's best selling chip Besides, we have lots of experience



Paul Johnson – Oric Technical Director

with it and software for it has already been built up For example we can quite easily modify the MicroTan disc operating system to run on the Oric.

To make sure the sound on the Oric was good we gave it the GI8912 sound chip — that's the one most arcade machines use — anything you hear in the arcades you should get on your Oric

Unlike most Z80-based machines, the Oric has a colour resolution of 1 x 6 pixels The Spectrum — for example — can take only two colours in any 8 x 8 pixel square

"The most exciting thing for me about the Oric says Paul "is its serial attributes capability It will be invaluable in fast games to save memory If you want a laser Zap on the screen — like in *Galaxians* — you *Poke* the two attributes at the start and finish of the laser Zap and the computer will join up the line

One of the reasons the Oric is priced so low is the number of chips it contains. By using 64K DRam chips the 48K Oric only needs eight memory chips

Another key feature of the design is the gate array designed by Paul This large chip is the 'hardware master' Simply what it does is to control what goes into the processor and when The clock timer from the CPU is fed into the gate array and it uses this to organise all the video output, to carry out all the address multiplexing for the memory and in so doing to control the CPU

"As a starting point, I knew that we wanted a viewdata compatible display We did the TTL version back in the summer I designed it in my study at home — I just had to get away from the phone!

"Once you have the TTL version working, you know the logic is OK Then I went to the US to California Devices Inc who were going to do the CMOS arrays CMOS technology is different from TTL so we first laid the thing out as a plan to see where the problems would be Then we did a simulation of a new logic diagram and worked out the timing paths

Tangerine had the first Oric working as long ago as August last year, using TTL emulators in place of the finished gate arrays "When the first finished gate array chips came through from California Devices in early December we took out the emulator, plugged in the chip and it worked first time It was quite a relief!

One innovative part of the Oric is its digital PAL colour video encoder This is the part of the micro which puts the correct colours on the screen in the correct places

"My PhD is in high-speed analogue to digital converters for use in digital television explained Paul "So I just went back to my notes and genned back up 'The beauty of the digital system is that it is all done with integrated circuits

"As well as being a great games machine, a lot of businessmen will buy the Oric to learn about computing Some of them will go on to invest maybe £20 000 in a larger system but for the corner sweet shop the Oric is all that is needed

'Orics will not however be used to run a multi-million pound business or a nuclear power station" grinned Paul

In the latter case one can only hope that he is right!

Tangerine team (Left to right) Peter Halford (Software) Andy Brown Chris Shaw Barry Muncaster (Director of Tangerine and Oric) and Paul Kaufman (Software)

Little Brother throws down the gauntlet

***Tony Bridge** looks at some of the latest software to come on the market for the ZX81*

For a while, after the Spectrum was announced, the flood of software for the ZX81 slowed to a mere trickle. Now with the delays in delivery, and the stiff competition making people think twice before investing, software houses have taken heart, and once again come on stream with products for Little Brother.

This latest batch of software is rather a varied one. There is the usual majority of games, but there is also the odd, interesting program of a more serious nature.

First up is *The Gauntlet*, from Colourmatic Computing. A very colourful cassette box contains a version of *Scrambler*. Once loaded, good attention-getting graphics wait for the "1- or 2-player?" input. The keys used for movement (Q, W, A and S) are fairly well grouped, although the wider spacing of W, A, D and X would probably have been even better on the '81's small keyboard.

The program runs in a rather jerky fashion, but the game is good, with a number of features, including five or six airlocks (I'm rather hazy on this point, never having reached such dizzy heights!). There is a high-score table, which may be saved on tape for future games, although inexplicably the table has no accommodation for names. Full use is made of the 81's character set in the very healthy explosions. Good documentation and packaging, together with excellent game mechanics, make this highly addictive game very good value for money.

From Computer Rentals, of London, come three games. *North Sea Trawler* is a novel graphic Management game. As the name suggests, you are the captain of a trawler doomed to fish the seas off the north-east coast of Scotland. Whilst dodging various natural hazards in the waters, and undergoing strikes, engine breakdown, crew incompetence and so on, you must net a good catch and get as much money as you can for your catch. A map of the area is available to you, and summaries of your inventory, with prevailing prices at the ports.

The Keys of Gondrun is, as you may surmise from the name, an adventure game. A novel feature of this program is the multiple choices available in answer to most situations, thus making it rather easier for clods such as me, who can never seem to find the appropriate word to give the computer.

Galactic Patrol, the final game submitted for review by this company, unfortunately refused to load under any circumstances.

Now here is a chance to win some money with your ZX81 — as much as £300 000, claims the author of the next program, Mr Puzzleman. *Lojix* is the name of it, and the author will put £1 for each one sold into a bank account. The first person who solves the puzzle will collect whatever is currently in the account.

Mr Puzzleman reckons that, as 300,000 ZX81's have been sold in the UK, that is the potential number of pound notes going into the account.

So, how hard is the puzzle? A chessboard has to be covered by a number of irregularly-shaped 'pieces', in much the same way as the Pyramid Puzzle, which enjoyed a certain vogue earlier in 1982, or Dr Bono's well-known L-puzzle. Not only is Lojix extremely hard — frustrating even! — but, I'm glad to say, is also one of the most stylish I've seen for the 81, admirably suiting the computer's graphics.

Fortunately it is also highly addictive with machine-code responses. I'm now torn between seeing the solution when it is published, to put me out of my misery, and being kept blissfully unaware of the solution, so as to prolong the life of the puzzle.

If £300 000 is not enough for you, how about a jackpot on the pools? Hartland Software promise you at least a good crack at winning the pools using their *Football Forecasting Program*. The results of the 81-82 season are stored in the program, and the data is used to forecast the results of matches (you may also use your own data, should you wish).

A lot of hard work has gone into the production of this program, so I hesitate to say that, in the two weeks over which I tried it, no score draws at all were forecast correctly. Two weeks is, of course, too short a time for a meaningful test. I would expect that over the season the Law of Averages would give you a good chance of breaking even.

Staying with the more serious side of ZX software, we come to the products of Saxon Computing. These are *Database Manager* and *Forecasting/Graphs (Time Series Analyser)*. The tapes come with comprehensive documentation, although the section dealing with suggested applications for the *Database* program was not forthcoming as promised, at least in the review copy. Data manipulation in the *TSA* program was impressive, with statistics, averages, percentages and so on being calculated from your data.

All the usual features are present in the *Database* program, including Amend, Search, Delete and so on. The authors

Tony Bridge – optimistic about the future of the ZX81

rightly warn against the program being used in time-wasting exercises such as compiling Personal Telephone Directories, which are more easily done with the good old pencil and paper.

Hestacrest is 'committed to low cost business software', and to this end has just released two more low-cost tapes to complement their *Accounts* package. The new programs are *Sales Ledger* and *Purchase Ledger*. We received the former for review, and found it to be as excellent as the *Accounts* tape. Full documentation is supplied — typed to keep costs down — and the program itself would be very helpful to a small one-man business in keeping tabs on its finances.

Bridge Software is an established name in the ZX world, and has released two new tapes: *Lynchmob*, which we shall return to in a moment, and, staying in the non-game sector, *Ephemeris*. This is billed as "an observer's guide to the Galaxy". The program asks you, with the aid of nicely laid-out screens, for the present date, time and latitude/longitude.

From these data, the computer then works out, for each planetary body and the Sun, the altitude, azimuth, distance from earth, rise and set times and so on. This is



a good program for home astronomers, taking all the drudgery out of these calculations An acknowledgement is given to Paul Duffet-Smith's 'Practical Astronomy with your Calculator'

Lynchmob brings us back to the games, and is of course a version of Hangman, set in the Wild West There is a good instruction page, and the game itself runs well with fine graphics depicting an evil-looking cowboy complete with spurs and Abe Lincoln beard

The *Break* key is not disabled, which is a pity in a program likely to be used by smaller children However if *Break* is inadvertantly pressed REM statements are displayed which describe how to get the program going again As far as I know this is unique and a practice that other authors should follow

Saltcoats was immortalised in song by Billy Connolly when he was half of a group called The Humblebums Now Saltcoats in Ayrshire is immortalised in the annals of ZX software by Messrs Morrison and Anderson They have produced two tapes of 1K programs, one of which Tape A, they have sent us for review, together with listings of another 10 which comprise Tape B, naturally enough

The games are the usual collection of *Asteroids Galaxians, Defender Squash, Sketch* etc , but containing machine code, as they do all the games run very fast Tape B has a more intellectual flavour with *Simon Towers of Hanoi* and *Mastermind* all making an appearance

There is also would you believe a 1K adventure *Haunted House* The authors have packed an awful lot into the tiny memory and the graphics are among the best I've seen yet on a 1K machine — the *Galaxians* game even has a High Score!

Another collection — this time for 16K — comes from Enigma They've called their tape *Enigma One* and it contains six puzzles Included here are old favourites like *Towers of Hanoi* (again), *Solitaire* and *Flanders Wheel* along with some new ones as *Dilemma* and *Crossover 6* The puzzles are all very difficult and feature excellent graphics Like the Saltcoats collection this one is extremely good value if you are a devotee of this kind of game and is probably the definitive collection of cerebral puzzles for the ZX81

From the sublime to the faintly ridiculous! *Love* is an adventure game from Remsoft This is a text Adventure for women and places you, poor defenceless creature, in a bedroom in Poke Hall (honest!) You are wearing pyjamas, and have with you a suitcase All the usual word-inputs are recognised plus a few non-standard ones like "Love", "Cry", "Kiss", etc which will give you a pretty good idea of the general mood of the Adventure

You are beset on all sides by no, not monsters of the animal kind but rather of the human kind The Rude Sinclair Mr Ram Pac and others are trying to seduce you and another word that you might find useful in these situations — and one which I'm ashamed to say came readily to my mind — is "Undress"! On the practical side things get a bit tedious, as the words all have to be typed in full The program is in Basic but the computer goes into FAST mode after accepting a command so reaction times are fairly rapid

So, the program works as an Adventure should but do women need an adventure such as this? Sexism doesn't often rear its ugly head in the world of computer software — Ms Pacman and that lady frog in Frogger excepted — and I'm not sure that the authors (D Bollen and H McEwen) are women anyway!

Se habla espagnol? Now we come to a batch of programs from JSR, a Spanish-based company Their catalogue of new releases is evenly spread with games and utility programs

Super-Graphics Toolkit is the title of the first one and explains itself fairly well The tape contains the main program together with a demonstration program and also the main program on it's own The demonstration can quickly be erased, however, when finished with While most of the other programs came with excellent English instructions only Spanish instructions were included in this program My few weeks in Majorca were not enough to cope with translating Sinclair-ese! I could not, therefore do justice to the program

The demonstration was very impressive and by the time you read this JSR will no doubt have produbed full instructions for their Graphics toolkit (es todo?) Just some of the facilities (that I could understand!) are, *Scroll* in any direction, *Invert* any character *Flash* any character, and so on

Orchestra is an ambitious music/sounds editor that works extremely well With this program it is possible to produce melodies of up to 3 000 notes from your ZX81 — almost enough for a symphony! The menu will give you six options After entering your melody which admittedly is rather laborious, each individual note and its duration having to be entered, you may then edit to your heart's delight It is also possible to test between two notes, or repeat just a section of the melody — which you may then ask to be repeated a number of times if required

You may also change the speed of the whole piece, or duration of individual notes *Concert* will play back your symphonic efforts, or alternatively the melody already stored in the program which turns out to be Rondo à la Turk All you need is to turn up your TV's volume This a truly impressive program

3D Space Battle is the promising name of the first games program Upon loading — and, in common with all the other tapes this program is preceded by a short loading program to get the loading level right — you are presented with a view of the near galaxy from your spacecraft window The documentation promises that you will then be assailed by bloodthirsty aliens which you have to annihilate with your lasers Maybe something went wrong in loading the machine code, but I could not get any enemy ships at all!

I fared better with *Alunijaze (Lunar Lander)* which is a pretty good version of the old favourite You can choose to land your lunar module on one of three pads on the moon's surface The easiest route increases your score by a factor of two whilst taking the most difficult route is rewarded with five times your score As you get close to the pad, the view is magnified, so that you can really see in detail all those little jagged lunar rocks ready to smash your craft to pieces Your fuel is running out all the time, and your mission is to gain as high a score as possible in the time given

Unfortunately, there is no high score system so each game is entirely separate It is however, a highly addictive game, and I rate it as good value for money This is a very good first release from this new Spanish company

Summary

All in all a pretty optimistic-looking future lies ahead for the ZX81 There is obviously plenty of life left in Little Brother ■

Saxon Computing 3 St Catherine's Drive Leconfield North Humberside HU17 7NT
Mr Puzzleman 13 Cherry Tree Walk Newpark Pontyclun Mid Glamorgan CF7 8RG.
Remsoft 18 George Street Brighton BN2 1RH
JSR Software Chalet Capvespre Avda de Rhode No 253 Apartadeo de Correos No 188 Rosas (Gerona) Espana
Hestacrest PO BOX 19 Leighton Buzzard
Hartland Software 9 Penzance Place London W11
Bridge Software 36 Fernwood Marple Bridge Stockport Cheshire
Enigma 24 Main Road Littlehale Sleaford Lincolnshire
Computer Rentals 140 Whitechapel Road London E1
Colourmatic Computing: 40 Longfellow Road Coventry W Midlands

Open Forum is for you to publish your programs and ideas. Take care that the listings you send in are all bug-free. Your documentation should start with a general description of the program and what it does and then give some detail of how the program is constructed. We will pay the _Program of the Week_ double our new fee of £6 for each program published.

Pontoon

on Vic-20

This program is written for a Vic20 with at least 3K extra memory. If you have more memory remember to change the screen and colour addresses in the program. In this version of *Pontoon* you play against the computer and the first to go bust is the loser. Your money, Vic's money, the stake, and all the cards dealt so far in one game are shown on the screen.

You always place the bet unless you win a game in which case Vic will either double the last bet (if he has enough money) or he will put half his money at stake in an attempt to win back money lost. If you get a five-card trick or a straight win (ie ace king) then the screen flashes and sound effects are made.

In the program there are two separate packs. The first A$(I) contains a nice and neat pack of cards. The second pack B$(I) takes out randomly cards from A$ (checking that none is taken twice) to produce the 'playing' pack. The pack is re-shuffled when the number of cards undealt drops below 12. This can be changed if you want (line 100). The actual cards are shown with the suit in the middle and the value above. If X is 10, J is Jack, etc.

Program notes

Lines	
15	Display title, set up variables and wait for you to hit a key
30 to 90	Set up shuffled deck (B$)
110 to 135	Draw card subroutine
200 to 300	Get the values of four cards. Gosub routine to get bets
345	Subroutine to display value and suit of card
560 to 700	Subroutine to place bets.
700 to 720	Vic's bankrupt!!!
800 to 900	Turn B$(I) into values/codes for display
1000 to 1090	Player's turn.
1200 to 1290	Vic's turn.
1300 to 1320	Vic wins (five-card trick).
3000	Vic wins
4000	You win
4500	Straight win (ie ace, king)
5000	You win (five-card trick)
6000	You lose!!!
POKES	
7680 to 8185	Screen (memory mapped)
38424 to 38884	Colour (memory mapped)
36874 to 36877	Sound generators.
36878	Volume

```
5 Poke36878,15 Poke36879,90 Print"█" dima$(51)
  dimb$(51) c$=","
6 d4=100000 p4=100000 f=0
7 bd=0
8 fora=0to21 Poke7680+a,160 Poke38400+a,(aand7)
  Poke8164+a,160 Poke38884+a,(aand7) next
9 fora1=0to484step22 Poke7680+a1,160 Poke38400+a1,
  (a1and7) next
10 fora2=0to484step22 Poke7701+a2,160 Poke38421+a2,
  (a2and7) next
11 Print"████████         " Print"████
  Pontoon  " Print"████          "
12 Print"████    for    " Print"████
  " Print"████   vic-20  "
13 Print"████by kelvin hepburn" Print"████hit
  a key to start██"
14 geta$ ifa$=""then14
30 i=0 c$="," forc=1to4 forn=1to13 Print
  "█████████shuffling█"
40 a$(i)=str$(n)+c$+str$(c) Poke36875,170+i
  i=i+1 ifi>51then55
45 next next
55 Poke36875,0 fori=0to51
60 r=int(rnd(1)*52)
70 ifa$(r)="d"andi<=51thengoto60
80 b$(i)=a$(r) a$(r)="d"
85 ifi=51then100
90 Poke36875,170+51-i next
100 Poke36875,0 Poke36877,0 Print"█"
  iff>=40thenf=0 goto30
105 g=102 i=3 gosub110 i=i+l+1 gosub110 i=311
  gosub110 i=i+l+1 gosub110 goto200
110 forl=0to2 form=0to6
120 Poke7700+i+m*22+l,0
130 next next Poke36875,150 foru=1to20 next
  Poke36875,0
135 return
200 fort=1to100 next f=f+1 g=200
229 deffnw(x)=val(right$(b$(f),1))
230 def fnv(x)=val(left$(b$(f),3))
240 d1=fnv(1) e=fnw(1) f=f+1 d2=fnv(1) m1=fnw(1)
255 f=f+1 P1=fnv(1) k=fnw(1) f=f+1 P2=fnv(1)
  y=fnw(1) gosub600 goto1000
345 Poke7680+43+i,w2 Poke7680+87+i,w1 Poke38400+
  43+i,a Poke38400+87+i,a return
500 ifw2=10thenw2=128+10
510 ifw2=11thenw2=128+17
520 ifw2=12thenw2=128+11
530 ifw2=13thenw2=128+1
540 goto850
560 Print"██████████my money=£"d4
563 ifd4<=0thengoto720
607 ifp4<=0thengoto6000
610 Print"██████████████your money=£"p4
620 ifd4<d5thenbt=bt*2 goto625
623 goto630
625 ifd4-bt<0thenbt=int(d4/2) ifd4=1thenbt=d4
626 Print"██my bet is £"bt foru=1to900 next
  goto640
630 input"██your bet",bt
635 ifp4-bt<0thenPrint"██you ain't got that
  much! bet again cheat!   " goto637
636 goto640
637 foru=1to100 Poke36875,130 Poke36877,130 next
  goto100
640 d5=d4 Print"██stake=£"bt return
720 Poke36877,220 forl=15to0step-1 Poke36875,l
  form=1to20 Poke36879,int(rnd(1)*255)
721 Print"█████bankrupt!!!" nextm,l Poke36877,0
  Poke36878,0 goto6040
800 Poke36875,150 foru=1to20 next Poke36875,0
805 w1=val(right$(b$(f),1))
810 w2=val(left$(b$(f),3))
840 ifw2>9thengoto500 goto850
841 ifw2=9thenw2=24 goto850
845 w2=w2+49
850 ifw1=1thenw1=65 a=0
855 ifw1=2thenw1=83 a=2
860 ifw1=3thenw1=88 a=0
865 ifw1=4thenw1=90 a=2
870 return
1000 Print"██████████----------------------
1001 Print"████████████-----------------------
1002 t=0 s(1)=0 s(2)=0 s(3)=0 s(4)=0 s(0)=0
1003 w1=k w2=p1 i=311 gosub840 gosub110 gosub345
  w1=y w2=p2 i=i+l+1 gosub840 gosub110
1004 gosub345
1005 p1=p1+1 p2=p2+1
1006 ifp1>10andp1<>14thenp1=10
1007 ifp2>10andp2<>14thenp2=10
1008 ifp1=14thenp1=11 s(t)=10 t=t+1
1009 ifp2=14thenp2=11 s(t)=10 t=t+1
1010 tp=p1+p2 iftp=21thengoto4500
1015 ca=1
1020 Print"████████████████stick or twist"
1030 getq$ ifq$=""then1030
```

Turn to page 17



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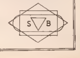
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```
1035 if$="s"thengoto1200
1050 f=f+1 gosub800 l=l+l+1 gosub110 gosub345
1060 p3=fnv(1) p3=p3+1
1062 ifp3>10andp3<>14thenp3=10
1065 ifp3=14thenp3=11 s(t)=10
1067 tp=tp+p3
1070 iftp>21ands(1)=0ands(2)=0thengoto1072
1071 goto1075
1072 ifs(3)=0ands(4)=0ands(0)=0thengoto3000
1075 foro=0tot iftp>21ands(o)=10thentp=tp-10
     s(o)=0 goto1070
1076 next
1077 t=t+1
1075 iftp=21thengoto4000
1080 ca=ca+1 ifca<=3thengoto1020
1090 goto5000
1200 iftp=21thengoto4000
1201 t=0
1202 q(1)=0 q(0)=0 q(2)=0 q(3)=0 q(4)=0
1220 l=3 w1=e w2=d1 gosub110 gosub840 gosub345
1230 l=l+l+1 w1=n1 w2=d2 gosub110 gosub840 gosub
     345 foru=1to450 next
1231 d1=d1+1 d2=d2+1
1232 ifd1>10andd1<>14thend1=10
1233 ifd2>10andd2<>14thend2=10
1235 ifd1=14thend1=11 q(t)=10 t=t+1
1236 ifd2=14thend2=11 q(t)=10 t=t+1
1238 td=d1+d2 iftd>tportd=21then3000
1239 ca=1
1240 f=f+1
1250 l=l+l+1 gosub110 gosub800 gosub345 foru=
     1to450 next
1260 d3=fnv(1)
1261 d3=d3+1
1262 ifd3>10andd3<>14thend3=10
1263 ifd3=14thend3=11 q(t)=10
1267 td=td+d3
1270 iftd>21andq(0)=0andq(1)=0then1272
1271 goto1277
1272 ifq(2)=0andq(3)=0andq(4)=0thenprint"bust"
     goto4000
1277 forr=0tot iftd>21andq(r)=10thentd=td-10
     q(r)=0 goto1270
1278 next
1280 iftd>tpthengoto3000
1285 t=t+1
1300 ca=ca+1 ifca<=3thengoto1200
1305 forl=1to9 form=100to10step-10
1310 poke36875,130+m poke36879,m next next
1320 forl=1to15 form=15to1step-3 poke36875,215+m
     poke36879,m+1 next next poke36875,0
1325 poke36879,90
1330 print"5 card trick!" d4=d4+bt p4=p4-bt for
     t=1to3500 next print"" goto100
3000 poke36875,140 foru=1to250 next poke36875,
     130 foru=1to400 next poke36875,0
3005 iftp>21thengoto3200
3010 print"I win sucker!    "
3020 d4=d4+bt p4=p4-bt ifp4=0then6000
3040 foru=1to3500 next
3041 print"" goto100
3200 print"Wha'you bust      " fort=1to1000 next
     print" I win!       " goto3020
4000 foru=1to3 fort=10to50step2 poke36878,15
4010 print"You win          " poke36875,175+t
     nextt,u
4015 poke36875,0
4020 print"lucky win!        " d4=d4-bt p4=p4+
     bt foru=1to3500 next print"" got
o100
4500 print"i did'nt get a chance"
4505 forl=1to9 form=10to100step10
4510 poke36875,150+m poke36879,m next next
4514 forl=1to15 form=1to15step3 poke36875,230+m
     poke36879,110+m next next poke36875,0
4518 poke36879,90 d4=d4-bt p4=p4+bt foru=1to3500
     next print"" goto100
5000 forl=1to9 form=10to100step10
5005 poke36875,150+m poke36875,m next next
5010 forl=1to15 form=1to15step3 poke36875,230+m
     poke36879,85+m next next poke36875,0
5015 poke36879,90
5020 print"5 card trick!" d4=d4-bt p4=p4+bt
     fort=1to3500 next print"" goto100
6000 print""
6010 print"y y ooo u u"
6011 print" y  o o u u"
6012 print" y  o o u u"
6013 print" y  ooo uuu"
6014 print"____________"
6015 print"            "
6016 print"l   ooo sss eee"
6017 print"l   o o s   e  "
6018 print"l   o o sss eee"
6019 print"l   o o   s e  "
6020 print"lll ooo sss eee"
6021 print"______________" print"______________"
6030 poke36877,300 forl=15to0step-1 poke36878,1
     poke36879,int(rnd(1)*255)
6035 form=1to300 next next poke36877,0 poke
     36878,0 poke36875,90
6040 print"another go(y/n)?"
6045 geta$ ifa$=""then6045
6050 ifa$="n"then6060
6055 run
6060 print"bye,chicken!!!"
```

Pontoon
by Kelvin Hepburn

Attack

on Dragon

This program is a game for the Dragon which puts to good use its extensive graphics capabilities. When the game is run a defender type shape appears on the left hand side of the screen which can fire and be moved up and down by use of the right joystick.

The object of the game is to hit the two objects moving towards you as many times as possible in the time allowed (75 secs). These objects move in both sin and cos curves and score 100 points for every direct hit.

Your score will be displayed at the end of the game but to give you an indication of how well you are doing during the game a vertical line will appear in the top left hand corner of the screen for every hit.

Program notes

Lines	
30	Switches processor into fast mode
60 to 60	See if instructions are required
100	Sets mode and clears screen
110 to 300	Set up screen
210	Plays start tune
220	Plays start tune
230	Reads joystick
240	Checks to see if time is up
250 to 300	Calculate positions of enemy objects
310	P£=shape of objects (£=$)
320 to 340	Draw enemy objects.
350	Checks fire button
360 to 370	Blank out enemy ready for new positions.
380	Plays tune if fire button is pressed
400 to 540	If y value of your ship equals that of the enemy and the fire button is pressed draw a line between ship and enemy to indicate laser. Also play tune
450 to 470	If the enemy is not in line with your ship and the fire button is pressed draw laser going off the screen
480 to 510	Make sure ship does not go off the screen and see if movement of joystick is large enough to warrant a movement.
530 to 540	If hit then draw explosion
550 to 500	Draw line at top of screen for every hit
610	Draw your ship
630 to 640	Draw and erase your ship
700	When finished switch processor laser to slow mode

Program follows on page 18

```
10 '***DRAGON ATTACK***
20 '**BY PAUL FERGUSON**
30 POKE65495,0
40 M=RND(10) HH=0 C=RND(
 20) X=250 Z1=50 T=5
50 FOR D=1 TO 300 NEXT D
60 CLS0 SOUND200,1 PRINT
 @160,"DO YOU WANT INSTR
 UCTIONS ? (Y/N)"
70 E$=INKEY$ IF E$="Y" T
 HEN 720
80 IF E$="N" THEN 100
90 IF E$<>"Y" OR E$<>"N"
  THEN 50
100 PCLS PMODE3,1 SCREEN
 1,0
110 LINE(1,0)-(44,20),PS
 ET,BF
120 LINE(1,191)-(44,165)
 ,PSET,BF
130 L$="F4E3F7R2E4F5R6E6
 R0F5R3E3F4R4E6F4R4E10F4
 E3F0R10E19F10E7F10R15E1
 0F10E0R3E4"
140 B$="BM45,164," T$="B
 M45,10,"
150 G$="E10BG10F10BH10G1
 0BE10H10BF10'
160 LINE(45,0)-(45,191),
 PSET
170 DRAWB$ DRAWL$ DRAWT$
  DRAWL$
180 PAINT(150,180),3,4
190 PAINT(150,6),3,4
200 A$="D2L2D4R2D2R35E1H
 2L15H5L14'
210 TIMER=0
220 PLAY'T1MCDEFGABCCBAG
 FEDC"
230 Q=JOYSTK(0) Z=JOYSTK
 (1) Z=Z*4
240 IF TIMER>=4000 THEN
 660
250 X=X-5 IF X<=50 THEN
 X=250
260 Y=(INT(SIN(N)*50)+85
 ) M=M+0 2
270 F=(INT(COS(C)*30)+85
 ) C=C+0 4 F$=STR$(F)
280 X$=STR$(X) Y$=STR$(Y
 )
290 L$="BM"+X$+","+Y$+",
 "
300 K$="BM"+X$+","+F$+",
 "
310 P$="R10D10L10U9R8D8L
 7U8R6D7L4U7'
320 COLOR3 2 DRAWL$ DRAW
 P$
330 DRAWK$ DRAWF$ COLOR2
 ,3
340 COLOR1 2
350 P=PEEK(65280) IF P=1
 26 OR P= 254 THEN I=1
360 COLOR2,3 DRAWL$ DRAW
 P$
370 DRAWK$ DRAWP$ COLOR1
 ,2
380 IF I=1 THEN PLAY"T15
 V15O5CL80BL80AL80GL80FL
 80EL80DL80CL80" K=Z1 GO
 TO400
390 GOTO480
400 U$=STR$(K+7) B$=STR$
 (X-50) I=0 V=Z1+7
410 N$=STR$(Y+9) J$=STR$
 (F+8)
420 IF (V-(Y+10))<=0 AND
  (V-(Y+10))>=-9  THEN D
 RAW"BM50,"+U$+",C3R"+B$
 +"," DRAW"BM"+X$+","+N$
 +",C3,XG$," EX=1
430 IF(V-(F+10))<=0 AND
 (V-(F+10))>=-9 THEN DRA
 W"BM50,"+U$+",C3R"+B$+"
 ;" DRAW"BM"+X$+","+J$+"
 ,XG$," CX=1
440 IF(V-(Y+10))<=0 AND
 (V-(Y+10))>=-9 OR (V-(F
 +10))<=0 AND (V-(F+10))
 >=-9 THEN PLAY"T1V31O1C
 L100BL100AL100GL100FL10
 0EL100DL100CL100"
450 IF EX=0 AND CX=0 THE
 N DRAW "BM50,"+U$+";C3R
 260 IF X>50 AND X<250 A
 ND EX=1 OR CX=1 THEN HH
 =HH+1
470 COLOR2 3 DRAW"BM50,"
 +U$+",R200" COLOR3,2
480 IF Z-Z1>10 THEN Z=Z1
 +10
490 IF Z-Z1<-10 THEN Z=Z
 1-10
500 IF Z>=141 THEN Z=140
510 IF Z<=30 THEN Z=30
520 COLOR2,3
530 IF EX=1 THEN DRAW"BM
 "+X$+","+N$+",XG$;"
540 IF CX=1 THEN DRAW "B
 M"+X$+","+J$+",XG$,"
550 IF EX=1 OR CX=1 THEN
  T=T+4 XX=1 T$=STR$(T)
560 IF XX=1 THEN DRAW"BM
 "+T$+",5,D10"
570 XX=0
580 COLOR3,2
590 EX=0 CX=0
600 Z$=STR$(Z) P$=STR$(Z
 1)
610 B$="BM4,"+Z$+"," C$=
 "BM4,"+P$+","
620 IF Z=Z1 THEN 230
630 COLOR  DRAWC$ DRAW
 A$
640 COLOR1   DRAWB$ DRAW
 A$
650 Z1=Z GOTO230
660 CLS1 PLAY"O3T100V31C
 DEFGAB'[illegible]DEFGABCDE
 FGABCDEFGAB' PRINT"YOUR
```

```
 TIME IS UP'
670 PRINT"YOU SCORED " H
 H*100"POINTS
680 PRINT@160,"ANOTHER ?
 (Y/N)"
690 R$=INKEY$ IF R$="Y"
 THEN 40
700 IF R$="N" THEN POKE
 65494,0 END
710 IF R$<>"Y" OR R$<>"N
 " THEN 680
720 CLS1 SOUND234,2 PRIN
 T@2 "*********DRAGON
 ATTACK*********"
730 PRINT@ THE OBJECT
 OF THE GAME IS TO HITT
 HE OBJECT MOVING FROM
 THE RIGHT OF THE SC
 REEN AS MANY TIMES
 AS POSSIBLE IN THE TIME
 ALLOWED(75 SECS) "
740 PRINT' YOU WILL GA
 IN 100 POINTS FOR EVERY
 OBJECT HIT NOTE YOUR S
 HIP CANNOT BE DESTROYED
 NEITHER CAN THE ENEMY!
 "
750 PRINT@416,"PRESS 'S
 TO START'
760 O$=INKEY$
770 IF O$="" THEN 760
780 IF O$='S' THEN 100
790 GOTO 750
```

Attack
by Paul Ferguson

Tables

on Spectrum

This program is designed to allow children to practice their tables by either multiplication or division Two attempts are permitted at each question before the correct answer is displayed but the first answer must be correct to score

It is necessary to enter the same number of digits as the correct answer before the computer will respond The range of the table may be altered by modification of lines 45 and 260

Program notes

Lines	
30 to 50	Determines type of question
100 to 110	Sets counter to zero
130	Notifies if answer correct.
160 to 170	Give final score and allows choice for next test.
160	Inverse video reads WELL DONE YOU GOT FULL MARKS
190 to 270	Determine choice of next test.
250	Inverse video reads SCORE "1" out of " 0
260 to 340 & 410 to 900	Set questions and totals questions asked
260 to 900	Deal with incorrect answers.
370 to 410	Graphics "D"
1000 to 1240	Read keyboard and determine whether answer is correct or not.
2000 to 2050	Create division sign
3020	Graphics D

```
   1 REM  Tables
   2 REM © Derry Wilman 1982
  10 GO SUB 2000
  20 CLS
  30 PRINT "Which table do you w
ant?" "(ENTER 1 to 10)"
  40 INPUT b
  45 IF b>10 THEN GO TO 20
  50 PRINT ,b
  60 PRINT
  70 PRINT "multiplication or di
vision?" "(ENTER m or d)"
  80 INPUT x$
  90 PRINT ,x$
 100 LET f=0
 110 LET g=0
 120 PAUSE 50  GO TO 190
 130 PRINT  CORRECT   IF count=0
 THEN LET f=f+1
 140 PAUSE 100
 150 CLS
 160 IF g=10 AND f=10 THEN PRINT
 AT 10 9 [illegible]
     PRINT AT
 to repeat or " 1" to change
 the table   GO TO 190
 170 IF g=10 AND f<10 THEN PRIN
T AT 10 0 "you got " f " out of
10    PRINT AT 15 0 "Press "r"
to repeat or " 1"  to change tab
le    GO TO 190
 180 GO TO 240
 190 IF INKEY$="" THEN GO TO 190
 200 LET q$=INKEY$
 210 IF q$="1" THEN GO TO 20
 220 IF q$="r" THEN GO TO 100
 230 IF q$<>"1" AND q$<>"r" THEN
GO TO 190
 240 CLS
 250 PRINT AT 20 15 [illegible]
 260 LET d=0
 270 LET count=0
 280 LET a=1+INT (RND*10)
 290 LET h=a*b
 300 IF x$="m" THEN GO TO 320
 310 IF x$="d" THEN GO TO 410
 320 PRINT AT 9 9,a " x ",b, "="
 330 LET c=h
 340 GO TO 900
 350 LET count=count+1
 360 IF x$="m" AND count=2 THEN
PRINT "Wrong  " a " x " b, "=",h  P
AUSE 300  GO TO 140
 370 IF x$="d" AND count=2 THEN
PRINT "Wrong, " h " D ",b "=",a
PAUSE 300  GO TO 140
 380 LET d=0
 390 PRINT "Wrong, Try again"  P
AUSE 100
 400 GO TO 1000
 410 PRINT AT 9 9 h " D " b "=?"
 420 LET c=a
 900 LET g=g+1
1000 IF INKEY$<>"" THEN GO TO 10
00
1010 IF INKEY$="" THEN GO TO 101
0
1020 LET k=VAL INKEY$
1030 PRINT AT 1+d,0 k
1040 IF k=c THEN PAUSE 100  GO T
O 130
1050 IF k>c THEN GO TO 350
1060 IF c>=10 AND k<10 AND k<>1 T
HEN GO TO 350
1070 IF k<c AND c-10<0 THEN GO T
O 350
1090 IF INKEY$<>"" THEN GO TO 10
90
1100 IF INKEY$="" THEN GO TO 110
0
1110 LET l=VAL INKEY$
1120 LET k=k*10+l
1130 PRINT AT 1+d,0 k
1140 IF k=c THEN PAUSE 100  GO T
O 130
1150 IF k<c THEN GO TO 350
1160 IF c>100 AND k<100 AND k>10
 THEN GO TO 350
1170 IF k<c AND c-100<0 THEN GO
TO 350
1180 IF INKEY$<>"" THEN GO TO 11
80
1190 IF INKEY$="" THEN GO TO 119
0
1200 LET m=VAL INKEY$
1210 LET k=k*10+m
1220 PRINT AT 1+4,0 k
1230 IF k=c THEN PAUSE 100  GO T
O 130
1240 IF k<>c THEN GO TO 350
2000 FOR n=0 TO 7
2010 READ x
2020 POKE USR "D"+n,x
2030 NEXT n
2040 DATA 0 0 24 0 126 0 24 0
2050 RETURN
```

Tables
by Derry Wilman

Morse Code

on Vic-20

This program is used to convert a sentence or word into morse code It asks you to type in a message and then it will send it out as morse code using sound, it also displays the letter it is on and its equivalent code with and _

Lines 40 to 200 are the main ones that convert the message into code and make the bleeps The rest is pretty straightforward

```
1 REM ####################
2 REM # ALAN BLACKHAM'S #
3 REM #    MORSE CODE   #
4 REM #    (10/10/82)   #
5 REM ####################
10 POKE36879 8
15 PRINT"MORSE CODE"
17 PRINT"
18 PRINT"TYPE IN MESSAGE!"
20 INPUT"MESSAGE",M$
30 L=LEN(M$)
40 FORI=1TOL
50 X$=MID$(M$,I,1)
52 PRINT X$," ",
55 IFX$=" "THENFORE=1TO400 NEXT
  PRINT GOTO200
60 RESTORE
70 READA$,B$
72 IFA$="-1"THEN PRINT"NOT
   PERMISABLE!" RUN
80 IFA$<>X$THEN 70
85 PRINT B$
90 FORR=1TOLEN(B$)
100 POKE36878 15
110 N$=MID$(B$,R,1)
120 IFN$="."THENG=70
130 IFN$="-"THENG=180
140 POKE36876,220
150 FORE=1TOG NEXT
160 POKE36876,0
163 FORY=1TO70 NEXT
165 NEXT R
200 FORY=1TO50 NEXTY,I
300 PRINT"ANY MORE(Y/N)?"
310 GETA$ IFA$=""THEN310
320 IFA$="N"THENPRINT"NO" END
330 IFA$="Y"THEN RUN
340 GOTO 310
```

Continued on page 20

Continued from page 19

```
500 REM**DATA FOR CODE **
502 DATA A,.-,B,-...,C,-.-.,D,-..,E,.,F,..-.,G,--.,H,....,I,..
510 DATA J,.---,K,-.-,L,.-..,M,--,N,-.,O,---,P,.--.,Q,--.-,R,.-.
520 DATA S,...,T,-,U,..-,V,...-,W,.--,X,-..-,Y,-.--,Z,--..
530 DATA 1,.----,2,..---,3,...--,4,....-,5,.....,6,-....,7,--...,8,---..,9,----.
,-1,-1

READY.
```

Morse Code
by Alan Blackham

Sound

on BBC Micro

This program allows full use of the BBC sound commands A chord can be played at the same time as a noise Various envelopes have been defined including piano and mouth organ

The function keys F1 to F9 have the envelopes F1 is Piano and F2 is Mouth Organ Noise can be made by pressing Shift and Z, X, (for pink) and V, B, N for white noise Try a piano envelope with Shifted V

The variable K is the number of keys pressed The array of N stores which notes are pressed Lines 620-640 stop the program coming to a halt by keeping the sound channels clear By pressing FO the notes you have played will be repeated *Delete* resets the envelopes The program has a range of two octaves

PROGRAM OF THE WEEK

```
   10 EN=1
   20 REM 7/11/82
   30 MODE7
   32 VDU 23,0,11,0,0,0,0,0,0
   33 MODE7
   40 DIMMOT%(1024,3):TI%=0
   50 K=1
   60 DIM N(3)
   70 PROCDISPLAY
   80 REM ENVELOPE SELECT
   90 REM ******** ******
  100 *FX 15,1
  110 IF INKEY(-90)=TRUE EN=0:FOR A=1 TO 3:ENVELOPE 1,0, 0,0,0,0,0,0, 126,-4,0,-
1,126,10:PRINTTAB(20,17);"ENVELOPE ";1:NEXTA
  120 :IF INKEY(-116)=TRUE THEN ENVELOPE EN,1,2,-2,2,6,1.2,6,1,1,-1,-1,63,126:PR
INTTAB(20,17);"ENVELOPE ";3:EN=EN+1
  130 IF INKEY(-114)=TRUE THEN ENVELOPE EN,0, 0,0,0,0,0,0, 126,-4,0,-1,126,10:PR
INTTAB(20,17);"ENVELOPE ";1:EN=EN+1
  140 IF INKEY(-115)=TRUE THEN ENVELOPE EN,10, 0,0,0,0,0,0, 60,10,0,-60,60,120:P
RINTTAB(20,17);"ENVELOPE ";2:EN=EN+1:IF EN>3 GOTO 220
  150 IF INKEY(-21)=TRUE THEN ENVELOPE EN,0, 2,-2,2,6,12,6, 126,-4,0,-1,126,100:
PRINTTAB(20,17);"ENVELOPE ";4:EN=EN+1:IF EN>3 GOTO 220
  160 IF INKEY(-117)=TRUE THEN ENVELOPE EN,1, 0,0,0,0,0,0, 5,126,0,-5,40,126::PR
INTTAB(20,17);"ENVELOPE ";5:EN=EN+1:IF EN>3 GOTO 220
  170 IF INKEY(-118)=TRUE THEN ENVELOPE EN,1, 50,50,50,2,2,2, 12,0,126,1,126,9::
PRINTTAB(20.17);"ENVELOPE ";6:EN=EN+1:IF EN>3 GOTO 220
  180 IF INKEY(-23)=TRUE THEN ENVELOPE 1,0, 2,0,2,6,12,6, 126,0,126,1,126,9:PRIN
TTAB(20,17);"ENVELOPE ";7
  190 IF INKEY(-119)=TRUE THEN ENVELOPE EN,1,100,100,100,100,100,100,25,-50,-50,
-50,126,90:PRINTTAB(20,17);"ENVELOPE ";8: EN=EN+1:IF EN>3 GOTO 220
  200 REM NOISE SELECT
  210 REM ***** ******
  220 IF INKEY(-1)<>TRUE GOTO290
  230 IF INKEY(-98)=TRUE SOUND 0,1,1,10
  240 IF INKEY(-67)=TRUE SOUND 0,1,2,10
  250 IF INKEY(-83)=TRUE SOUND 0,1.3,10
  260 IF INKEY(-100)=TRUE SOUND 0,1,4,10
  270 IF INKEY(-101)=TRUE SOUND 0,1,5,10
  280 IF INKEY(-86)=TRUE SOUND 0,1,6,10
  290 IF INKEY(-33)=TRUE PROCREPLAY
  300 REM NOTE SELECT
  310 REM **** ******
  320 IF INKEY(-66)=TRUE N(K)=53:K=K+1
  330 IF INKEY(-82)=TRUE N(K)=61:K=K+1
  340 IF INKEY(-51)=TRUE N(K)=69:K=K+1
  350 IF K>3 GOTO560 ELSE IF INKEY(-35)=TRUE N(K)=57:K=K+1
  360 IF K>3 GOTO560 ELSE IF INKEY(-52)=TRUE N(K)=65:K=K+1
  370 IF K>3 GOTO560 ELSE IF INKEY(-68)=TRUE N(K)=73:K=K+1
  380 IF K>3 GOTO560 ELSE IF INKEY(-36)=TRUE N(K)=77:K=K+1
```

```
390 IF K>3 GOTO560 ELSE IF INKEY(-64)=TRUE N(K)=81:K=K+1
400 IF K>3 GOTO560 ELSE IF INKEY(-69)=TRUE N(K)=85:K=K+1
410 IF K>3 GOTO560 ELSE IF INKEY(-85)=TRUE N(K)=89:K=K+1
420 IF K>3 GOTO560 ELSE IF INKEY(-54)=TRUE N(K)=93:K=K+1
430 IF K>3 GOTO560 ELSE IF INKEY(-70)=TRUE N(K)=97:K=K+1
440 IF K>3 GOTO560 ELSE IF INKEY(-71)=TRUE N(K)=101:K=K+1
450 IF K>3 GOTO560 ELSE IF INKEY(-2)=TRUE N(K)=49:K=K+1
460 IF K>3 GOTO560 ELSE IF INKEY(-65)=TRUE N(K)=41:K=K+1
470 IF K>3 GOTO560 ELSE IF INKEY(-55)=TRUE N(K)=105:K=K+1
480 IF K>3 GOTO560 ELSE IF INKEY(-87)=TRUE N(K)=109:K=K+1
490 IF K>3 GOTO560 ELSE IF INKEY(-88)=TRUE N(K)=117:K=K+1
500 IF K>3 GOTO560 ELSE IF INKEY(-56)=TRUE N(K)=113:K=K+1
510 IF K>3 GOTO560 ELSE IF INKEY(-73)=TRUE N(K)=121:K=K+1
520 IF K>3 GOTO560 ELSE IF INKEY(-72)=TRUE N(K)=125:K=K+1
530 IF K>3 GOTO560 ELSE IF INKEY(-89)=TRUE N(K)=129:K=K+1
540 IF K>3 GOTO560 ELSE IF INKEY(-57)=TRUE N(K)=133
550 IF K>3 GOTO560 ELSE IF INKEY(-74)=TRUE N(K)=137
560 PRINTTAB(5,10);CHR$141;"KEYS PRESSED ";K-1
570 PRINTTAB(5,11);CHR$141;"KEYS PRESSED ";K-1
580 PROCPLAY
590 GOTO 100
600 ***********************
610 DEFPROCPLAY
620 IF ADVAL(-6) > 3 THEN *FX 15,0
630 IF ADVAL(-7) > 3 THEN *FX 15,0
640 IF ADVAL(-8) > 3 THEN *FX 15,0
650 IF N(1)=0 SOUND &0201,0,N(1),5:GOTO670
660 SOUND &0201,1,N(1),5
670 IF N(2)=0 SOUND &0202,0,N(1),5:GOTO700
680 IF EN>1 ES=2 ELSE ES=1
690 SOUND &0202,ES,N(2),5
700 IF N(3)=0 SOUND &0203,0,N(1),5:GOTO730
710 IF EN>2 ES=3 ELSE ES=1
720 SOUND &0203,1,N(3),5
730 IF TI%>1024 GOTO750
740 MOT%(TI%,1)=N(1):MOT%(TI%,2)=N(2):MOT%(TI%,3)=N(3)
750 K=1:N(1)=0:N(2)=0:N(3)=0
760 TI%=TI%+1
770 ENDPROC
780 ***************************
790 DEFPROCDISPLAY
800 FOR A=2 TO 6 :PRINTTAB(0,A);CHR$129;CHR$157;CHR$135:
810 NEXT
820 FOR A=20 TO 25:PRINTTAB(0,A);CHR$129;CHR$157;CHR$135:NEXT
830 PRINTTAB(10,0);CHR$141;"SYNTHERSIZER"
840 PRINTTAB(10,1);CHR$141;'SYNTHERSIZER"
850 PRINTTAB(4,3);" f0=REPLAY :f1-f8=ENVELOPES:"
860 PRINTTAB(4,4);" delete=ENVELOPE RESET"
870 PRINTTAB(10,19);"NOISE:_"
880 PRINTTAB(4,20);"Use SHIFT and Z,X,C,V,B"
890 PRINTTAB(4,21);"Z,X,C=PINK NOISE"
900 PRINTTAB(4,22);'V,B,N=PINK NOISE"
910 PRINTTAB(4,23);"Z,B HIGH:X,B MEDIUM:C,N LOW"
920 ENDPROC
930 *************************
940 DEFPROCREPLAY
950 FOR A%=0 TO TI%
960 PROCPLAY
970 PRINTTAB(0,18);"REPLAY"
980 N(1)=MOT%(A%,1):N(2)=MOT%(A%,2):N(3)=MOT%(A%,2)
990 PROCPLAY
1000 NEXT
1010 PRINTTAB(0,18);"      "
1020 ENDPROC
```

Sound
by Robert Lober

Showing up the nature of the character held in the corner

Colin Cattanach presents two programs for searching around in the Vic20 memory.

Character recognition

When poking around in the Vic's memory, one is often uncertain which location a particular character is held in. This program which incorporates two options clearly shows the nature of the character held at a particular location, by printing an enlarged version of it at the bottom right-hand corner of the screen within an area of 160 × 160 pixels.

The 8 byte values which make up each character are printed for reference, alongside the relevant horizontal rows of dots. In a second option one may choose to view every character in an area of memory in turn, together with all the relevant byte data.

The program, as set out (Lines 230-350) will run on an unexpanded Vic. When the program is used with an expanded Vic (of 16K+) for which it was first developed one must first enter the following one line program

POKE 44 32 POKE 648 30 POKE 8192 0 NEW RUN.

Then press the *Run Stop* and *Restore* keys to regain the cursor. This fools the Vic into behaving as the unexpanded version. The program is now fed in, and operates as with the unexpanded Vic.

Byte = 66
Byte = 36
Byte = 36
Byte = 36
Byte = 169
Byte = 166
Byte = 165
Byte = 231

A word of warning. Having placed the program in the computer, be sure to save it on tape before a run. Experimenting with *Poke* commands can crash a program and it is very time-consuming entering all again from the keyboard.

The following additional lines to insert in the program, for use with the expanded Vic (16K+), illustrate the kind of situation the program may be used to investigate

```
2 PRINT PRINT INSTRUCTIONS FOLLOW IN 11
  SECS" FOR I=0 TO 1024 POKE 5120+I PEEK
  (32768+I) NEXT PRINT
3 PRINT FOR I=0 TO 1024 READ O IF O= -1
  THEN 5
4 POKE 6144+I O NEXT
5 POKE 36869 255 POKE 36866 PEEK (36866)
  OR 128
6 DATA 60 36 36 36 164 165 165 231 -1
10 FOR N=6137 TO 6144 FOR Y - 6144 TO 6151
  POKE N PEEK(Y) NEXT NEXT
```

Line 2 duplicates 128 characters held in Rom in the user's Basic program Ram from 5120 TO 6144. This area can now be used for programmable characters. Use the program to check the characters now held at say 32768 and 5120. Line 5 commands the Vic to seek characters at location 5120 onwards, rather than in Rom at 32768. Lines 3 4 and 6 have been used to insert a new character at 6144. Again check this by running the program. Line 10 transfers one character from location Y TO N.

The essential part of the program is in lines 300-350 which converts the decimal value inserted upon demand, to a binary number system, which is printed out to illustrate each line's byte value. The latter is then used to compile the enlarged character with a series of *Poke* values.

Word or Data Search

This progam will print out all the data recorded in your listings or search for and print out all the listings in which a particular word appears.

On a straight run, the program asks for the limits of the chosen area in memory to be viewed. This is then printed out at a rate suitable for scanning. It is often necessary to search for a piece of desired information recorded in memory, whose exact location is forgotten. With a large memory it would not be convenient to have to scan through all the memory every time. This is

Character recognition

```
1 REM "CHARACTER RECOGNITION(VIC)BY C.J.CATTANACH"
230 PRINT "CLH"
233 F=8000:G=81:H=38720:J=6
234 PRINT "VARIOUS OPTIONS ARE AVAILABLE": PRINT
235 PRINT "TO SEE CHARACTERS AT MEMORY POSITION 'K', 8
BYTE DATA, PRESS F1 & ENTER K"
236 PRINT:PRINT:PRINT"FOR PRINT-OUT OF ALL CHARACTERS,
PRESS F3"
238 GET A$: IF A$="" THEN 238
240 IF A$="F1" THEN 249
241 IF A$="F3" THEN 259
249 PRINT "CLH":PRINT:PRINT
250 PRINT "K=";:INPUT K: GOSUB 350
251 Z=PEEK(K)
252 GOSUB 300: IF F>8154 THEN 254
253 K=K+1: GOTO 251
254 PRINT:PRINT"PRESS ANY KEY TO CONTINUE"
255 GET B$:IF B$="" THEN 255
256 RUN 230
259 PRINT:PRINT:PRINT "ENTER POSITION K OF FIRST
CHARACTER": X=1: INPUT K
260 PRINT "CHARACTER";X;"IN MEMORY": X=X+1: GOSUB 350
261 Z=PEEK(K)
262 GOSUB 300: IF F>8154 THEN 264
263 K=K+1: GOTO 261
264 FOR T=1 TO 2000: NEXT
265 PRINT "CLR"
266 F=8080: G=81: H=38720: J=6
268 GOTO 260
300 L=Z/2:IF(L-INT(L))*2=1 THEN 325
302 M=INT(L)/2:IF(M-INT(M))*2=1 THEN 327
304 N=INT(M)/2: IF (N-INT(N))*2=1 THEN 329
306 P=INT(N)/2: IF (P-INT(P))*2=1 THEN 331
308 Q=INT(P)/2: IF (Q-INT(Q))*2=1 THEN 333
310 R=INT(Q)/2: IF (R-INT(R))*2=1 THEN 335
312 S=INT(R)/2: IF (S-INT(S))*2=1 THEN 337
314 T=INT(S)/2: IF (T-INT(T))*2=1 THEN 339
316 F=F+22: H=H+22:RETURN
325 POKE F+7,G:POKE H+7,J: GOTO 302
327 POKE F+6,G POKE H+6,J:GOTO 304
329 POKE F+5,G: POKE H+5,J: GOTO 306
331 POKE F+4,G: POKE H+4,J: GOTO 308
333 POKE F+3,G: POKE H+3,J: GOTO 310
335 POKE F+2,G: POKE H+2,J: GOTO 312
337 POKE F+1,G: POKE H+1,J: GOTO 314
339 POKE F,G: POKE H,J: GOTO 316
350 FOR T=1 TO 12: PRINT: NEXT: FOR L=K TOP K+7: PRINT
TAB(2); "BYTE=";PEEK(L): NEXT: RETURN
```

where the word Search comes in useful

On entering *Run* 4000 one is asked to supply the word to be searched for A systematic search is then carried out of all recorded information, and all sentences containing the word in question are printed out on the screen, with the word high-lighted in red

The program is obviously of more use with an expanded Vic, which has a greater memory capacity for recording information But by placing less information on file one can experiment with it using the basic machine The program as listed takes up about a third of the memory available with the 16K expansion, leaving plenty of room to record more information to search through, using the Word Search procedure

Lines 52 and 55 ask for the limits of information to be printed out in the straight *Run* mode, pertaining to the area of memory covered by Listings 100-184 The latter can easily be expanded, of course, providing the routines in lines 10-14 and lines 70-74 are also expanded

Lines 10-14 direct the operation in hand to the lines of information to be printed on the screen These are further defined by lines 70-74 which direct exactly which lines are to be printed out between limits of lines 100 and 184 This covers 84 listings or 84 × 4 = 336 lines of screen print With 16K one can easily incorporate 1000 lines of screen print It is important to ensure that the maximum value of L inserted on demand, line 55, falls within the limits of recorded data, i e the D$ values of lines 100-184 Failure to observe this can lead to annoying hold ups

Before running the Word Search program, lines 4000-4210, one should ensure that the value 84 in line 4005 represents the maximum number of recorded pieces of information in the listings 100-184 (i e the maximum number of values for D$) In the initial Word Search, lines 4005-4025 cause every sentence of information to be scanned for the presence of the Desired Word C$ If this is found line 4200 prints out the actual listing of the sentence in which the word occurs

Lines 4201-4203 decide which part of the sentence shall be printed in blue and which shall be in red (the high-lighted word appears in red) Line 4208 prints one letter at a time in blue, and line 4210 prints in red Line 4204 and also line 60 contains the time delay values T between each sentence printed, and may easily be altered

After the Word Search and the resulting print on the screen, one is given the option, lines 4100-4114 of a repeat viewing of the same data, (pressing F1), or one is asked for the next word to be searched for (pressing F7) ■

Record or individual word search

```
  1  REM  "RECORD  SEARCH OR INDIVIDUAL  WORD  SEARCH  BY
C.J.CATANACH"
  5 GOTO 49
 10 IF Z<18 THEN 70
 11 IF Z=>18 AND Z=< 34 THEN 71
 12 IF Z=>35 AND Z=< 51 THEN 72
 13 IF Z=>52 AND Z=< 68 THEN 73
 14 IF Z=>69 AND Z=< 85 THEN 74
 49 PRINT "(CLR) MAXIMUM STATEMENTS LISTED IS 84": PRINT:
PRINT " FOR WORD SEARCH RUN 4000": PRINT
 50 PRINT"GIVE VALUES OF 'K' TO 'L' REVIEWED":PRINT
 52 PRINT"K=";:INPUT K
 55 PRINT "L=";:INPUT L
 58  FOR  Z=K TO L:GOSUB  10:PRINT"(Z=";Z;  "LIST  NO.=";
Z+99")":PRINT
 60 PRINT D$:PRINT:PRINT:FOR T=1 TO 2000:NEXT:NEXT
 62 PRINT:PRINT:"END OF DATA":STOP
 70 ON Z GOSUB 100, 101, 102, 104, 105, 106, 107, 108, 109,
110, 111, 112, 113, 114, 115, 116: RETURN
 71 ON Z-17 GOSUB 117,................133:RETURN
 72 ON Z-34 GOSUB 133,................150:RETURN
 73 ON Z-51 GOSUB 151,................167:RETURN
 74 ON Z-68 GOSUB 168,................184:RETURN
 990  REM LINES 100 TO 184 CONTAIN FILED INFORMATION  (MAX
OF 4 LINES TO EACH LIST NUMBER)
 100  D$="  THIS IS THE FIRST PIECE OF INFORMATION  FILED,
AND MAY TAKE UP A MAXIMUM OF FOUR SCREEN LINES":RETURN
 184   D$=" THIS IS THE LAST PEICE OF  INFORMATION  FILED,
OUT OF 84 LISTINGS':RETURN
4000 PRINT"(CLR) GIVE WORD SOUGHT":PRINT:PRINT"WORD C$=";:
INPUT C$
4005 FOR Z=1 TO 84: GOSUB 10
4009 N=LEN(C$)
4015 FOR R=1 TO (LEN(D$)-N)
4020 IF MID$(D$,R,N)=C$ THEN 4200
4025 NEXT:NEXT
4100 PRINT:PRINT"PRESS F1 FOR NEXT SEARCH"
4101 PRINT'PRESS F7 FOR REPEAT VIEWING"
4110 GET F$:IF F$="' THEN 4110
4112 IF F$="(F1)" THEN 4000
4114 IF F$='(F7)" THEN 4005
4200 PRINT:PRINT"Z=";Z;" (LIST NO=";Z+99;")": PRINT
4201 FOR R=1 TO LEN(D$)
4202 IF MID$(D$,R,N)<>C$ THEN 4208
4203 IF MID$(D$,R,N) =C$ THEN 4209
4204 FOR T=1 TO 3000:NEXT:PRINT:PRINT:PRINT:GOTO 4025
4208 PRINT MID$(D$,R,1);:NEXT
4209 FOR X=R TO R+N-1
4210  PRINT"(RED)"MID$(D$,X,1);:NEXT:  PRINT  "(BLUE)'  ;:
R=R+N:NEXT
```

Type founts galore

***Ian Farquharson** explains how to create and store your own character sets.*

The Spectrum character set, or at least the upper case letters and numbers, was copied across from the ZX81 without any changes. To make any changes to the ZX81 character set, an expensive hardware add-on was required, such as the excellent DK'tronics unit.

Most Spectrum owners know how to re-define the UDG characters. The only problem with these is their numbers — at most only 21 different shapes may be programmed. This means that you can not create foreign alphabets or new English type faces with more than 21 letters.

There is a way to get around this. If you look at page 173 of the ZX Spectrum Basic manual, at the bottom of the page is a note about the system variable called *Chars*. This is a pointer which holds the address of a byte which is always 256 bytes above where the Spectrum thinks the character set is located. This character set extends from 32 to 127 inclusive and can be sited anywhere in memory.

Having explained the principle I will now show you how to set up your own character table on a free part of the memory.

Firstly, you will need to set up some space for the character table near to the top of your free Ram. This will require 768 bytes of memory. In a 48K machine it is best to begin at 64000 decimal. To protect this area you should execute the command *Clear* 63999 which resets the Ramtop so that the area above is kept free from the program and data.

Secondly, you will need to copy the existing character set from its location in Rom into the new character table. (This will not be needed if you are going to redefine the entire set as we will over-write the old set.) To relocate the character set the following short Basic program is used:

```
10 FOR Z=15616 TO 16384
20 POKE Z+48384,PEEK Z
30 NEXT Z
```

Thirdly, you can replace certain characters (or all) with your own type-faces by *Poking* in the appropriate eight bit numbers (1-255) to form the rows of your new characters. Remember to enter eight numbers for each character even if they are intended to be blank, as the previous contents will remain in the table and interfere with the new characters. The method of introducing the new characters into the table depends upon how many bytes need to be altered, but for most applications the following Basic program will probably suffice:

```
10 INPUT "Enter start address>" START
20 CLS
30 FOR Z=START TO 64267
40 INPUT (Z) "  " A$
50 LET A$="BIN "+A$
60 POKE Z,VAL A$
70 PRINT Z,A
80 POKE 23692,-1
90 NEXT Z
```

This short program requires the user to input the binary string representing the pattern of *Ink* and *Paper* pixels with a 1 for *Ink* and 0 for *Paper*. Ideally you should have worked out the characters on graph paper beforehand to simplify the process of entering the new characters.

Once you have changed the relevant characters you will want to test out your creations. To do this you must alter *Chars* to point to 63744, which is 256 less than the first character. Because of the location, which is on a ¼K boundary, you need only alter the most significant byte of this variable. The actual value which needs to be poked is 249 (249x256=63744). To do this type *Poke* 23607,249 followed by *Enter*. With luck you should find your new type-face being used in the automatic listing.

If you have made a mistake and set the machine to use a character set which contains just spare bytes or garbage such as the program area, Rom, or a machine routine, you will find that the listing has either disappeared or turned into a mass of grey squares; do not panic. All you need do is type *Poke* 23607,60 to restore the pointer to its original position in the Sinclair Rom. You will not be able to see this command as you type it but if you are careful this should not prove difficult.

Once the character set is working correctly you can delete any Basic program as usual with *New*. When this is done the original Sinclair set will be used. You can always restore the programmed table by entering *Poke* 23607,249. The old set may be called up at any time by the command *Poke* 23607,60.

The following data, when entered at the specified locations using the program in the third stage, with line 50 removed, will replace the upper case letters and the numerical set with a futuristic type face which can only be described as similar to those used in the arcade game 'Defender'.

Numbers 1 to 9 and 0

```
64128 0 126 102 106 198 114 126 0
64136 0 24 120 24 24 24 126 0
64144 0 126 2,2 126 96 126 0
64152 0 126 6 62 6 6 126 0
64160 0 96 96 100 126 4 4 0
64168 0 126,96 96 126 2 126 0
64176 0 126 96 96 126 98 126 0
64184 0 126 6 6 6 6 6 0
64192 0 126,98 126 98 98 126 0
64200 0 126 98 98 126 2 2,0
```

Upper case letters A to Z

```
64264 0 126 98 98 126 98 98 0
64272 0 126 98 124 98 98 126 0
64280 0 126 96 96 96 96 126 0
64288 0 124 98 98 98 98 124 0
64296 0 126 96 124 96 96 126 0
64304 0 126 96 124 96 96 96 0
64312 0 126 64 94 102 98 126 0
64320 0 98 98 126 98 98 98 0
64328 0 126 24 24 24 24 126 0
64336 0 126 24 24 24 24 120 0
64344 0 100 104 112 104 100 98 0
64352 0 96 96 96 96 96 126 0
64360 0 126 106 106 106 106 106 0
64368 0 126 98 98 98 98 98 0
64376 0 126 98 98 98 98 126 0
64384 0 126 98 98 126 96 96 0
64392 0 126 98 98 106 102 126 0
64400 0 126 98 98 126 104 102,0
64408 0 126 96 126 2 2 126 0
64416 0 126 24 24 24 24 24 0
64424 0 98 98 98 98 98 126 0
64432 0 98 98 98 98 52,24 0
64440 0 106 106 106 106 106 126 0
64448 0 102 102,24 102 102 102 0
64456 0 98 98 98 126 6 6 0
64464 0 126 12 24 48 96 126 0
```

Once you have your character set safely stored away and working, you will want to save it on tape. To use them in a future session all that is required to be done is clear some memory, load the character table, and set the pointer to it. To do this type *Save* "Charset" *Code* 64000,768 then *Enter*. The whole process should only take a few seconds. Because there is a lot of typing involved in entering the data it would be advisable to verify the data. This is done with *Verify* "Charset" *Code* 64000,768, which checks the saved data against the data in memory to make sure the saving operation has been properly done.

It should be remembered that this is basically a project for those willing to experiment with the principle. The only fault with this system is that all the keywords will also change. It is advisable to turn on the new set at the beginning of the program and to restore it just before you list the program. Doing this will allow you to extend the character set by defining the five characters after Z for both upper and lower case use, but will not corrupt these symbols in the listing.

This program has been written for use on the 48K version of the ZX Spectrum. It could be used on a 16K version with changes to all the addresses which are above 16384. But as you would be left with less than 8K of memory for your own Basic programs, it would limit the use of many commercial programs which have been written tightly into the free memory space of the 16K machine. ■

Dictionary compiler

3270 The design is now *Drawn* next to the grid, using the new E$ which has been created *Drawing* it at scale 8 ensures that its proportions though not its size are the same as the design created on the grid.

3280-3300 The design is displayed until a key is pressed then control is returned to Module 4 Note that the scale for *Drawing* must be returned to the normal 4 before a *Return* is made otherwise subsequent use of the *Draw* command will produce over size results.

Testing

Having defined a design on the grid, you should now be able to call up this module by pressing key E and after a lengthy pause see it displayed at half scale. Stopping the program will allow you to examine the E$ which the module has created. Note that no check is made that your design is not too complex to be drawn by a string of up to 255 characters so that too full a grid might result in an error, though this is unlikely to happen

Module 7 *Lines 6000-6090*

The function of this module is to allow the design which the user has created to be saved on tape in the form of a string. You will note that the module is more simple than many of the data file modules of earlier programs this is because its sole purpose is to save a single string

Testing

You should now be able to save E$ on tape. This can be verified by calling up this module, then stopping the program and clearing the variables. Insert at 8888 a single line instruction to open an input file by the name of CHAR and input E$, not forgetting to close the file. You may then print out E$ in direct mode or DRAW it to check that it has been satisfactorily recorded and reclaimed. If this is successful then the program is complete and you are ready to proceed to the second half of the high resolution text section

CHARACTERS *Summary of single key functions*

With cursor flashing

0 — erases square on grid where cursor is situated

I — inks in square on grid where cursor is situated

R — rotates design within grid by *90* degrees anti-clockwise

M — calls subroutine which moves design within grid

I — transforms design within grid into its mirror image

E — creates string which will duplicate design if DRAWn

S — saves design on tape

The Working Dragon 32, by David Lawrence costs £5.95 and is available from Sunshine Books Ltd., Hobhouse Court, 19 Whitcomb Street London WC2 7HF

With large M drawn to the right of the grid 1 2, 3 or 4 — specifying corner towards which design is to be moved.

Summary

This program is an odd one in that as it stands, it is almost completely useless. That is to say all it accomplishes is to store strings defining small-scale designs or characters onto tape — hardly a stunning feat. In combination with other programs, however, which will pick up the characters created and compile them into usable character sets, and modules which will allow you to use such character sets easily in high resolution *Pmodes*, the program becomes an indispensable tool which enables the Dragon to exceed its normal capabilities

Going further

(1) A character creator is hardly much use unless you are prepared to sit down and define some characters. Though this may seem an incredibly difficult and boring task at first glance a moment's reflection will suffice to realise that a complete set of characters, already defined in pixels, is laid out before you in the listings given in this book. Alternative styles of lettering can be found in the program listings in any computer magazine. With such examples to work from, you really should have no difficulty in building up a collection of worthwhile characters

(2) The program given does not necessarily always make the best use of the 255 characters of string space available for E$. This is because a blank move always uses the BM notation which requires at least seven characters (BM+2 −2) and possibly 9. An interesting challenge would be to insert a routine to test whether such a blank move could be covered by one of the single-letter *Draw* instructions — for instance the blank move given above could just as easily have been defined by BE2 which would result in a considerable saving.

Dictionary

Having created characters it now only remains for them to be combined in such a way as to be useful for subsequent programs. The program which follows is designed to accomplish this by holding in memory up to 100 characters at one time, with the possibility of more being picked up from tape in batches of one hundred. The characters so stored can then be combined into collections such as "ABCDEF-GHI etc to provide material for high resolution programs which require text. In later programs we shall examine practical modules for using such character sets without constantly having to specify DRAW commands in the program

MODULE 1 *Lines 1000-1150*

A standard menu module

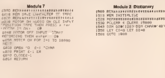
MODULE 2 *Lines 1500-1560*

This module sets aside sufficient memory for the necessary PMODE and reserves the rest of the available memory for strings as well as setting up the necessary variables

Commentary

1540 The main dictionary of characters will be held in the string array DI$. The number of elements which this array will be capable of holding will depend on the complexity of the characters and, therefore the length of the strings required to *Draw* them. The character set currently being compiled will be held in the string array *Chars*

1550 CI and DI record the number of characters stored in the character set and the dictionary ■

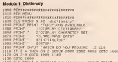


Module 7

```
6000 REM************************
6010 REM SAVE CHARACTER TO TAPE
6020 REM************************
6030 MOTOR ON AUDIO ON CLS INPUT
"POSITION TAPE THEN PRESS enter
(MOTOR IS ON)  Q$
6040 MOTOR OFF INPUT  START
RECORDING THEN enter   Q$
6050 MOTOR ON FOR I=1 TO 10000
NEXT
6060 OPEN "O  £-1 "CHAR
6070 PRINT £-1 E$
6080 CLOSE£-1
6090 RETURN
```

Module 2 Dictionary

```
1500 REM************************
1510 REM INITIALISE
1520 REM************************
1530 PCLEAR 4 CLEAR 15000
1540 DIM DI$(120) DIM CHAR$(40)
1550 LET CI=0 LET DI=0
1560 GOTO 1000
```



Module 1 Dictionary

```
1000 REM************************
1010 REM MENU
1020 REM************************
1030 CLS PRINT @ 42  dictionary"
1040 PRINT PRINT "FUNCTIONS AVAILABLE
1050 PRINT     1)DISPLAY DICTIONARY
1060 PRINT "   2)DISPLAY CHARACTER SET
1070 PRINT     3)LOAD SAVE DATA"
1080 PRINT     4)INITIALISE"
1090 PRINT     5)STOP"
1100 PRINT INPUT "WHICH DO YOU REQUIRE  ;Z CLS
1110 IF Z 4 THEN ON Z GOSUB 2000 2500 5000 GOTO 1000
1120 ON Z-3 GOTO 1500 1140
1130 GOTO 1000
1140 CLS PRINT @ 7*32+10 "dictionary  PRINT PRINT "
PROGRAM TERMINATED"
1150 STOP
```


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Wanted

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Ziggurat

Marvellous Mediocrity

I recently bought a calculator with a square-root facility and integral quartz watch

Have I bought a calculator with a time-keeping facility or have I bought a time-keeper with a calculating facility, or did I really buy what I wanted something to tell the time and something to perform simple calculations?

An alternative would have been to have bought a wristwatch with an integral calculator function — one of those with tiny little buttons you push with a point — but being clumsy I needed big keys That my purchase was much larger than such a watch (though wafer thin, so I was informed) was an advantage not a disadvantage To reduce the size of the watch plus calculator to that of a half penny (new version) is to reduce its appeal — small is a pain!

The trouble with small things is that In the ant a house the dew is flood (or so goes an Iranian proverb) and this is very true of electrical devices

So far, in the short history of computing the trend has been towards miniaturisation To what extent can this be continued? Or rather to what extent *should* this reduction be continued and in what directions? Ask yourself where many of the problems and some of the benefits of small computers lie In the smallness of the computer

The popularity of proper keyboards for the Sinclair computers and the many ploys people use to cool such small microcomputers (remember the old carton of milk caper for the ZX80?) reveal some of the drawbacks As anybody who has played with crystal sets and simple transistor radios will know when you place electronic components close to each other interactions begin to take place between the components If one is not so very careful in the layout of the printed-circuit board funny things happen — purely by electrical induction you can get a change from what is supposed to happen

Brian Josephson a British physicist developed a new technology in 1962 Called by the generic term 'Josephson devices' or "Josephson junctions', these are integrated circuits which act as superconductors at low temperatures (near absolute zero −273°C) These devices were to be used to develop a (so far) theoretical supercomputer by IBM which was to be little greater in volume than a Sinclair Spectrum but immensely more powerful

My hands are not over large but my fingers still prefer a full-size keyboard if I am to use a computer as a computer rather than as a specialised tool I can see that for particular applications such a specialised tool would have a use but the beauty of the computer as an artifact is that it is so adaptable When I see some of the present generation (sorry — present set) of miniscule computers, I wish more thought had gone into the package It is no use having a superb language or operating system without a proper keyboard with space around the chips to let them breath with (of course) more on the price

Simply the argument is that miniaturisation can only go so far in the physical package — humans are not shrinking in sympathy

It is undoubtedly a good thing that we have moved away from the vast computers — which were every bit as ingenious as our present crop of miniscule machines — but there has now become evident an over-reaction Small has stopped being good. Small is painful

I like a machine the size of an Atom, a Dragon, or a Vic Mediocre is marvellous! ■

Boris Allan

Puzzle

Memory question

Puzzle No 42

Jamie had been given some homework to do but, typically had left it at school

All he could remember of the question was that it consisted of two two-digit numbers multiplied together and a further one-digit number which was either to be added or subtracted The result produced a four-digit number with all the digits the same He also recalled that all the numbers to the left of the equals sign were either all even or all odd

Jamie drew out the following equation

__×__±_=****

Can you solve the puzzle for Jamie?

Solution to Puzzle No 37

The answer is $A = 92$ and $B = 58$

From the clues given we know that both *A* and *B* are greater than 32 as they have four-digit squares Also *A* is greater than *B* by at least ten (Clue 1 across) In the program the values *A* and *B* are entered into two *For/Next* loops and interlocking values are checked to see if corresponding digits match

```
10 FOR A = 42 TO 99
20 FOR B = 32 TO A - 10
30 LET A$ = STR$ A
40 LET B$ = STR$ B
50 LET C$ = STR$ (A * A)
60 LET D$ = STR$ (B * B)
70 IF C$(1) < > B$(2) OR D$(3) < > C$(3) THEN
   GOTO 120
80 LET E$ = STR$ (A - B)
90 LET F$ = STR$ (A + B)
100 IF E$(1) < > D$(1) OR E$(1) < > F$(2) OR
E$(2) < > C$(2) OR F$(1) < > B$(1) OR F$(2)
< > E$(1) OR F$(3) < > D$(2) THEN GOTO 120
110 PRINT A,B
120 NEXT B
130 NEXT A
```

Winner of Puzzle No 37

The winner is Geoff Bogg, Holling Hill Lane Wickersley, Rotherham S. Yorks, who receives £10

Top 10

Atari

1(4)	Galaxians	(Atari)
2(3)	Air Strike	(English Software)
3(5)	Canyon Climber	(Data Soft)
4(1)	Raton Chase	(First Star)‡
5(10)	Scott Adams Adventures	(Adventure International)†
6(–)	Soccer	(Thorn EMI)*
7(–)	Frisbee Quest	(Adventure International)
8(–)	Chop Lifter	(Broderbund)‡
9(–)	Darts	(Thorn EMI)
10(–)	Missile Galaxians	(Atari)

*Cartridge. †24K cassette. ‡32K cassette. §48K disc.
(Figures compiled by Calisto Computers, Birmingham 021-632 6458)

ZX81

1(2)	3D Defender	(JK Greye)
2(4)	Flight Simulation	(Psion)
3(–)	King Kong	(Tony Barber)
4(8)	Gulp II	(Campbell Systems)
5(7)	Sea War	(Panda)
6(8)	Adventure 1	(Abersoft)
7(3)	Gauntlet	(Colourmatic)
8(–)	Football Manager	(Addictive Games)
9( )	Centipede	(Llamasoft)
10(10)	ZXAS	(Bug-Byte)

All 16K.
(Figures compiled by Buffer Micro Shop London 01 769 2887)

Spectrum

1(1)	The Hobbit	(Melbourne House)*
2(–)	Time Gate	(Quicksilva)*
3(2)	Penetrator	(Melbourne House)*
4(5)	Flight Simulation	(Psion)
5(3)	3D Tunnel	(New Generation)
6(–)	Football Manager	(Addictive Games)
7(4)	Arcadia	(Imagine)
8(–)	3D Tanx	(DK'Tronics)
9(5)	Hungry Horace	(Psion)
10(9)	Escape	(New Generation)

Requires 48K.
(Figures compiled by Buffer Micro Shop London 01 769 2887)

Vic20

1(1)	Annes Rabbit	(Llamasoft)
2(2)	Abductor	(Llamasoft)
3(–)	Frog	(Interceptor Software)
4( )	Alien Attack	(Interceptor Software)
5(5)	Gorf	(Commodore)*
6( )	Scramble	(Rabbit)
7(7)	Grid Runner	(Llamasoft)
8(–)	Martian Raider	(Hoses)
9(9)	Myriad	(Rabbit)
10(–)	Moons of Jupiter	(Rabbit)

*Cartridge †Requires 8K or 16K.
(Figures compiled by the Vic Centre London 01-992 8484)

Books

1(1)	Creative Graphics on the BBC Microcomputer *Cownie*	(Acornsoft)
2(–)	Spectrum Machine Language for the Absolute Beginner *Tang*	(Melbourne House)
3(2)	Assembly Language Programming for the BBC Micro *Birnbaum*	(Macmillan)
4(4)	Programming the 6502 *Zaks*	(Sybex)
5(7)	Basic Programming for the BBC Micro *Cryer*	(Prentice Hall)
6(8)	Over the Spectrum various authors	(Melbourne House)
7( )	The Z80 Instruction Handbook *Wadsworth*	(Hayden)
8(6)	Graphs and Charts on the BBC Micro *Harding*	(Acornsoft)
9( )	Rider of SuperCalc *Williams*	(MIR)
10(–)	Forth Programming *Scanlon*	(Sams)

(Figures compiled by Watford Technical Books, Watford 0923 23324)
(Last week's positions in brackets)